

Enhancement of Trying Through Vicarious Learning: A Developmental Investigation

**A Thesis Submitted
In Partial Fulfillment of the Requirements
for the Degree of**

DOCTOR OF PHILOSOPHY

**BY
N. R. MRINAL**

**to the
DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
INDIAN INSTITUTE OF TECHNOLOGY, KANPUR**

January, 1980

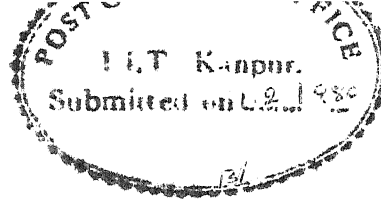
HSS-1900-D-MIR-ENH

65969

MAY 1981

To

My Parents



CERTIFICATE

This is to certify that the thesis "Enhancement of Trying Through Vicarious Learning : A Developmental Investigation" submitted by Mr. N.R. Mrinal to the Indian Institute of Technology, Kanpur in partial fulfillment of the requirements for the degree of Doctor of Philosophy is a record of bonafide research work carried out by him under my supervision and guidance for the last two years (17 months at the Indian Institute of Technology, Kanpur and 7 months at the Indian Institute of Management, Ahmedabad). The results embodied in the thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

Ahmedabad
January, 1980

Ramadhar Singh
Ramadhar Singh
Thesis Supervisor

CERTIFICATE

This is to certify that Mr. N.R. Mrinal has satisfactorily completed all the course requirements in the Ph.D. program in Psychology. He took the following courses:

H-Psy	784	:	Applied Social Psychology
H-Psy	777	:	Elements of Statistical Analysis
H-Psy	778	:	Experimental Design
H-Psy	780	:	Psychology of Personality
H-Psy	781	:	Development of Personality
H-Psy	783	:	Advanced Experimental Social Psychology
H-Psy	786	:	Understanding Organizational Behavior
H-Psy	789	:	Learning, Memory, & Cognition
H-Phi	771	:	Indian Philosophy II : Philosophy of Liberation and Ways of Growth

Mr. N.R. Mrinal was admitted to the candidacy of Ph.D. degree on 25th October, 1976, after he successfully completed the written and oral qualifying examinations.

K.N. Sharma

(K.N. Sharma)

Head

Department of Humanities
& Social Sciences

J.N. Dasgupta

Convener

Departmental Post-Graduate
Committee

ACKNOWLEDGEMENTS

It is a great pleasure to acknowledge the help I received from many persons in completing my graduate education. I am especially grateful to Dr. Ramadhar Singh who devoted an extremely large amount of his valuable time from the conception to the completion of this dissertation. I consider myself very fortunate to have been benefitted by his colossal mastery in the subject. His weighty suggestions and genuine criticisms have greatly influenced the shape of this dissertation. I am also grateful to Dr. Janak Pandey for his counsel from time to time. Thanks are also due to Dr. Usha Kumar, Mr. D.P. Tayal, and Dr. L. Krishnan for their contribution to my training in psychology.

I also take this opportunity to thank Drs. N.S. Chauhan, D.P. Sen Mazumdar, G.K. Makhija, and Ms. Neelima Misra who have been a source of encouragement to me. Their warm support and sincere help have contributed considerably to the completion of this work.

I wish to thank Dr. A.K. Dalal, Dr. S.K. Jain, Dr. B.N. Srivastava, Mr. Surya Prasad, and Mr. K.A. Bohra, my fellow graduate students, for the numerous discussions on the subject. I am thankful to Dr. Rakesh Srivastava, Mr. Nirankar Srivastava, Miss Sneh Shobha, Miss Prem Lata and Miss Leena Chatterjee for their help in various ways.

I also wish to record my appreciation to Dr. S.S. Kalra, Head, Department of Sociology, Halim Muslim College, Kanpur for providing me with the suitable facilities for data collection at several schools. I acknowledge the help of Mr. N.K. Robert of Computer Centre, and thank him for his cooperation and encouragement. I also appreciate the services of Mr. B.P. Misra and Mr. K.S. Bhacia of Psychology laboratory.

Miss R. Usha of the Indian Institute of Management, Ahmedabad took painstaking care in typing the entire manuscript. Although the time available to her was very little, she did an excellent job. I record my appreciation for her work, and thank her for the cooperation.

N. R. Mrinal
N.R. MRINAL

TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	vi
LIST OF FIGURES	vii
SYNOPSIS	S-1
CHAPTER 1 : INTRODUCTION	1
Performance = Motivation x Ability Controversy . . .	1
Vicarious Learning	5
Model and Observer Characteristics	8
The Present Investigation	15
CHAPTER 2 : METHOD	18
Selection and Preparation of Stories	18
Persistence Task	19
Design	21
Subjects	21
Procedure	22
CHAPTER 3 : RESULTS	25
Age of Subjects x Sex of Subjects x Model Analysis .	25
Characteristics of Subjects x Characteristics of	
Model Analysis	34
Supplimentary Analyses	42
Technical Comments	48
CHAPTER 4 : DISCUSSION	49
Model Effect	49
Observer and Model Characteristics	50
Implications	55
Methodological Considerations	56
Future Research	57
Concluding Comments	58
REFERENCE NOTE	60
REFERENCES	61
APPENDIX	67

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1.	Mean Age of Subjects of the Various Treatment Groups (in months)	22
2.	Summary of a $2 \times 2 \times 6$, Age of Subjects Sex of subjects \times Model Analysis of Variance on Persistence Measure	26
3.	Simple Effect of Age of Subjects at the Levels of Model	29
4.	Simple Effect of Models at the Levels of Age of Subjects	30
5.	Newman-Keuls Test on Persistence Measure of Younger Children	31
6.	Newman-Keuls Test on Persistence Measure of Older Children	32
7.	A 2^4 Age of Subjects \times Sex of Subjects \times Age of Model \times Sex of Model Analysis of Variance of Persistence Measure	35
8.	Simple Effect of Age of Model at the Levels of Age of Subjects	36
9.	Simple Effect of Age of Subjects at the Levels of the Age of Model	38
10.	Simple Effect of Sex of Model at the Levels of Sex of Subjects	41
11.	Simple Effect of Sex of Subject at the Levels of Sex of Model	42
12.	Summary Analyses of Variance for Younger and Older Children	46
13.	Simple Effect of Sex of Models on Older Boys and Girls	47

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1.	Mean Performance as a function of motivation and ability information.	3
2.	Persistence on the achievement task as a function of age of subjects and nature of model	27
3.	Persistence on the achievement task as a function of age of subjects and age of model	37
4.	Persistence on the achievement task as a function of sex of subjects and sex of model	40
5.	Persistence as a function of age of subjects, sex of subjects, and sex of model	44

Synopsis

Mrinal, N.R. Enhancement of trying through vicarious learning : A developmental investigation. Doctoral dissertation submitted to the Department of Humanities and Social Sciences, Indian Institute of Technology, Kanpur, India, December 1979. Supervisor: Ramadhar Singh.

The main purpose of the present research was to examine how models of stories influence trying by children on an achievement task. Stories having achievement theme and six different models (no model, i.e., control condition, crow, boy, girl, man, and woman) were read to children ($n = 360$) varying in age (4-5 vs 10-11 years) and sex, and their persistence on a problem-solving task was examined as a function of age and sex of the subjects and the nature of model. One prediction was that 4-5 year olds would try longer after exposure to crow than to human models, whereas 10-11 year olds would show the opposite tendency.

The second set of predictions concerned the four human models -- boy, girl, man, and woman. These four models constituted a 2×2 , Age of Model (Same-age vs Adult) \times Sex of Model (Same-sex vs Opposite-sex) design. As subjects also varied with respect to their age and sex, the complete design became a $2 \times 2 \times 2 \times 2$ (Age of Subjects \times Sex of Subjects \times Age of models \times Sex of models) factorial. In this complex 4-way design, relationships between the model and observer characteristics were points of principal interest.

Relationship between age of the subjects and models was considered from three theoretical perspectives. A strict similarity-imitation position predicted that a same-age model would be imitated more than an adult model. The status interpretation of age however suggested exactly the opposite relationship. A third possibility was suggested by the identification interpretation. According to the identification literature, the younger children would show the usual similarity-imitation relationship, while the older children would show a reversal. That is, predictions made by the similarity-imitation and by the status interpretation of age notions would hold true for younger and older children, respectively.

With respect to the effect of sex of subject and sex of model on trying, it was predicted that boys would show the usual similarity-imitation relationship, whereas the girls would not differ in their imitation of the same- and opposite-sex models. This prediction was based on the assumption that trying on achievement task is a masculine activity, and so girls may not respond to the sex of model at all.

A $2 \times 2 \times 5$ (Age of Subjects \times Sex of Subjects \times Models) analysis of variance detected two significant effects on trying. The main effect of model indicated that the model and control conditions differed in their effect on trying on the task. Children exposed to the passage without any achievement theme, i.e., control condition,

persisted on the task least. This suggests that exposure to story models did enhance trying to some extent.

The predicted age of subjects by model interaction was also present. The younger children were more influenced by the crow model than any other four models and control condition. On the contrary, the older children were more influenced by man than the other models. As the younger and older children tried equally under the control condition, it seemed justified to conclude that story models did enhance trying in a reliable way.

Analyses based on just the four human models disclosed some interesting results. The age of subjects by age of model interaction was statistically significant. Closer examination indicated that older children tried longer after exposure to the adult than to the child models, as was predicted by the identification and status interpretations of age. The younger children did not seem to have been influenced by the models; hence, their behavior was not interpretable within any of the three notions of status, similarity, or identification.

The sex of subjects by sex of model effect conformed to the prediction precisely. Boys imitated the same-sex model more than the opposite-sex model. Girls, in contrast, did not respond to the sex cue of the model at all. It should be added that this inter-

action was the dominant characteristic of trying by the older children; evidence for similar interaction with younger children was virtually absent.

Results were interpreted within the framework of similarity-attraction theory (Byrne, 1971), social learning theory (Bandura, 1972), and personality and persuasion theory (McGuire, 1968). Several methodological and technical points were also considered. Implications of the results were discussed for textbook writing, for further research on the topic, and for developmental psychology. The author hopes that the present work would draw attention of developmental and educational psychologists in India to the power of vicarious learning in enhancing trying.

CHAPTER 1

Introduction

"Performance = Motivation x Ability" Controversy

How do motivation and ability determine performance? Heider (1958), a noted social psychologist, made the following suggestion:

The personal constituents, namely, power (ability) and trying (effort) are related as a multiplicative combination, since the effective personal force (performance) is zero if either of them is zero. For instance, if a person has the ability but does not try at all he will make no progress toward the goal. (p. 83)

Heider's suggestion, $\text{Performance} = \text{Motivation} \times \text{Ability}$, is very similar to that of Hull (1943) who said, $\text{Reaction Potential} = \text{Drive} \times \text{Habit}$. Within both formulations, capability factor and energizing factor (motivation, trying) are considered to be essential. It is assumed that effectiveness of trying is contingent upon the level of ability of the person trying. Trying is thus believed to be more effective in case of those high in ability than those low in ability. This multiplicative formulation makes sense. But does this formulation have any empirical support?

Anderson and Butzin (1974) made the first empirical test of the Heider proposal, $\text{Performance} = \text{Motivation} \times \text{Ability}$. In two experiments, subjects were provided with information about the motivation and ability of target persons, applicants to graduate school and athletes trying out for college track, and were required to infer how the so-described persons would perform in their respective

field. The factorial plot of the Motivation x Ability data indicated a clear support for the multiplying process. A similar result was obtained in a developmental study by Kun, Parsons, and Ruble (1974). Comparable results across the two studies suggest that Heider's proposal for a multiplying rule is perhaps valid. To get an idea for the multiplying-type relationship, look at Panel A of Figure 1 which plots motivation and ability as row and column factors.

Attribution of performance from motivation and ability was studied by Singh and his associates in India also. In a series of three experiments, Singh, Gupta, and Dalal (1979) supplied information pertaining to motivation and ability of hypothetical students, and asked subjects to predict how the target persons would perform at their institution. Contrary to the implication of a multiplying model, data from all the three experiments evinced parallelism, as if subjects adopted a constant-weight averaging rule. Gupta (1979),

who studied attribution of performance among school children and college students, also corroborated this result. Results from these studies suggest that prediction of scholastic performance obeys an averaging rule in India. Panel B of Figure 1 shows a family of curves which is consistent with the constant-weight averaging model.

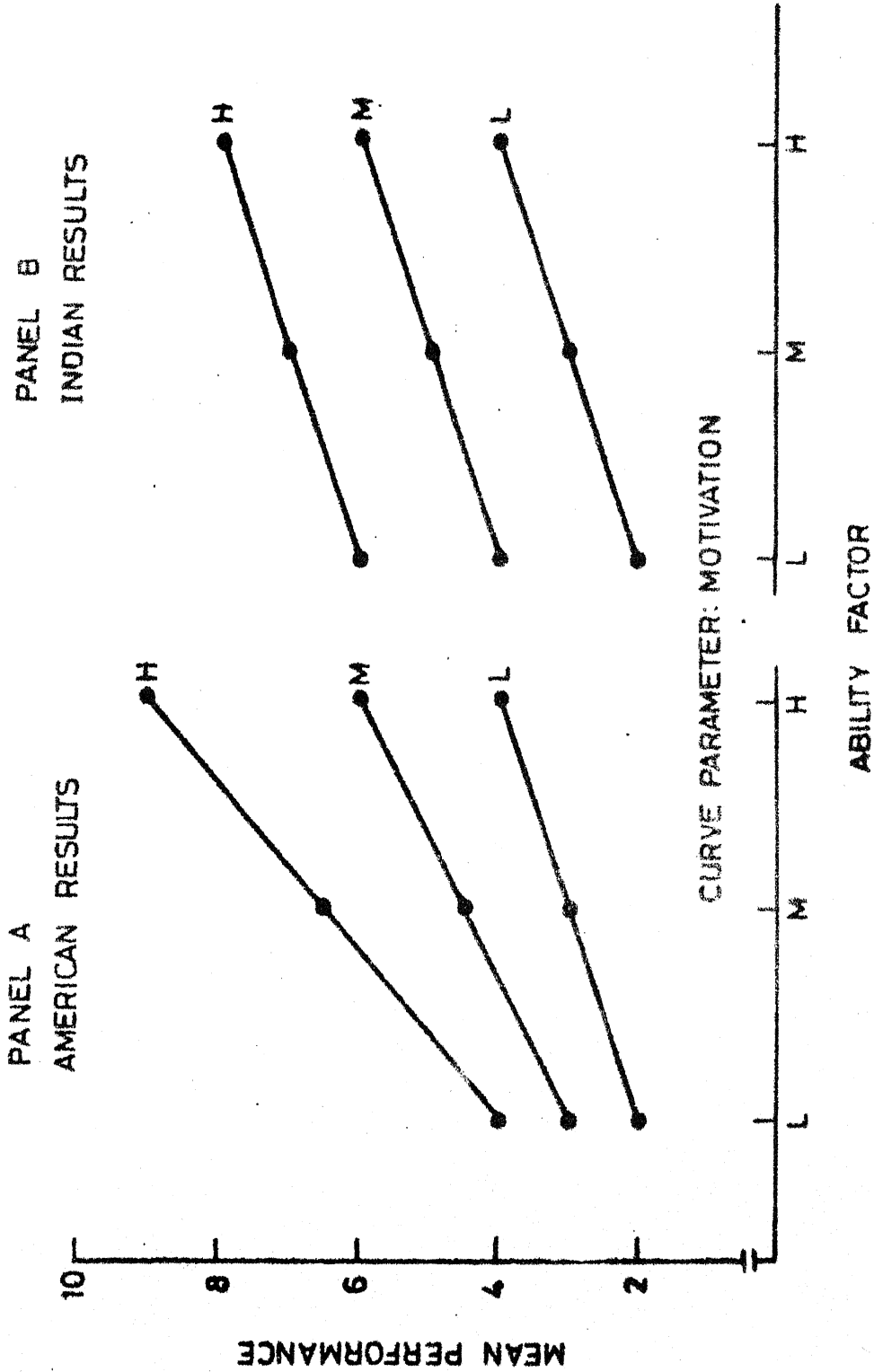


Figure 1. Mean performance as a function of motivation and ability information. Panel A shows multiplying type relationship; panel B shows constant-weight averaging type relationship. Letters L, M, and H denote low, moderate, and high levels.

Does the difference between the equal-weight averaging rule and multiplying rule suggest any difference in cultural outlook in India and America? Singh et al. (1979) note that equal-weight averaging implies that effort or trying will be equally effective with the person of low and high ability. This is in marked contrast with the multiplying rule, which implies that effort and trying will be more effective with the person of high ability. Thus, multiplying rule reduces the power of trying, whereas the equal weight averaging highlights the power of trying. As Singh et al. (1979) note:

"... the present equal-weight averaging model for attribution of performance appears to portray a more egalitarian outlook. Perhaps college students in India believe that each person, regardless of native ability, has equal opportunity to improve his or her lot." (p. 1350)

It appears that people's faith in the power of trying has increased (Murphy, 1953; Winter, 1969). To promote a solid egalitarian society, it is necessary that people be encouraged to put in more and more effort, and that behavioral scientists be involved in devising ways and means to facilitate the change process. Attempts to reduce dependency (Sinha, 1970; Sinha & Pandey, 1975) and augment need for achievement (Winter, 1969) are certainly steps in the right direction. But the amount of work in this area in relation to its seriousness and importance for social development is indeed negligible. The main purpose of present research was,

therefore, to examine usefulness of vicarious learning (Bandura, 1969, 1971) as a method of enhancing trying.

Vicarious Learning

One way to enhance trying is to administer proper reinforcements whenever people try. For example, parents, school teachers, and bosses can provide social reinforcement for trying at home, school, and work places, respectively. This process of response acquisition through trial and error is known as instrumental or operant conditioning. As the very name indicates, response by the learner is instrumental in getting the reinforcement (Miller & Dollard 1941; Skinner, 1953).

But the difficulty with the instrumental conditioning is that it requires active participation of both the learner and the trainer : The learner must emit the correct response; the trainer must deliver the appropriate reinforcement at appropriate time. Because of this requirement, it is exceedingly injudicious and impractical to rely primarily upon trial and error as a method of enhancing trying by children in schools and employees in organizations. Vicarious learning, which is known as imitation, observational learning, copying, social facilitation, contagion, identification, and role playing, has therefore emerged as a more powerful method of behavior modification in recent years.

According to Bandura (1965), the vicarious learning event can be defined as:

"... one in which new responses are acquired or the characteristics of existing response repertoires are modified as a function of observing the behavior of others and its reinforcing consequences, without the modeled responses being overtly performed by the viewer during the exposure period. In demonstrating vicarious learning phenomena, it is therefore necessary to employ a non-response acquisition procedure in which a subject simply observes a model's behavior, but otherwise performs no overt instrumental responses, nor is administered any reinforcing stimuli during the period of acquisition. Any learning that occurs under these limiting conditions is purely on an observational or covert basis. This mode of response acquisition is accordingly designated as no-trial learning, since the observer does not engage in any overt responding trials ..." (p. 3).

If mere observation can help the observer acquire a new response or change an old one, then vicarious learning can be expected to be of considerable use in enhancing trying.

All occasions for observation cannot however be expected to produce similar effects on behavior modification. Bandura (1969) conceptualizes vicarious learning as multiprocess phenomenon encompassing (a) attentional process that regulates sensory registration of modeling stimuli, (b) retention processes that are influenced by rehearsal operations and symbolic coding of modeled events into easily remembered schemes, (c) motoric reproduction processes which are concerned with the availability of component responses and the utilization of symbolic codes in guiding behavioral reproduction,

and (d) incentive or motivational processes which determine whether or not acquired responses will be activated into overt performances. Factors which influence any of these four subprocesses can therefore determine the amount of vicarious learning. It is not surprising then that psychologists interested in vicarious learning have employed various kinds of models -- live (e.g., Pandura, Ross, & Ross 1963; Bussey & Perry, 1973; Grusec & Mischel, 1966), film (e.g., Bandura & Huston, 1961; Bandura, Ross, & Ross, 1961; Bandura et al., 1963; Gerst, 1971; Grusec & Brinker 1972; Maccoby & Wilson, 1957; Perry & Perry, 1975), and stories (McArthur & Eisen, 1976). It is, however, surprising that stories, which are used so often by parents at home and in the textbooks of schools, have not been employed fully in behavior modification.

Textbooks full of stories and poems dealing with achievement theme have been in use since a long time. Most of us have had opportunity to go through the poem, King Bruce and the Spider and the story of a thirsty crow. Similarly, the Panchtantra, which consists of interesting stories of animals' effort, wiseness, and cooperation, is also very popular among children. Perhaps these stories and poems were written to emphasize importance of trying. But these stories cannot be of uniform effectiveness for children of all backgrounds. Consider, for example, the story of 'King Bruce and the Spider' and 'The Thirsty Crow'. Both stories emphasize : Try again and again! Try until you reach the goal! But the implied message may not be understood by

children of different age levels. Similarly, when human models are used, they vary with respect to age, sex, color, socio-economic status and so on. Isn't it important to evaluate how models having different characteristics affect trying, and accordingly to recommend suitable model⁵ for children of different backgrounds? Such an information would be extremely useful in the selection of stories in the text-books of different grades.

Model and Observer Characteristics

In his review of research on imitative behavior, Flanders (1968) found a number of model characteristics to be effective in determining imitative behavior. Some of the characteristics are control of resources valuable to the observer, status of model, nurturance, sex, degree of realism of models' performance and affective relationship between model and observer. Some subject variables have also been considered. They are sex, age, status and traits of the observer. These variables have remained subject of interest even in recent years, and a number of behaviors ranging from helping and hurting to cognitive controls (Baron & Byrne, 1977) have been subjected to models' influence.

In the present research, both sex and age of the subjects as well as of models have been considered simultaneously. At the practical level, such a design is useful in determining what type of model should be used for which type of subjects. But the theore-

tical reason is by no means less important. Much of the work within attraction paradigm (Byrne, 1969; 1971; Clore & Byrne, 1974) shows that similarity between two persons is a strong antecedent of attraction. Attraction, in turn, has been found to determine imitative behavior of subjects (Baron, 1970; Bussey & Perry, 1976; Rosenkrans, 1967; Smith, Smith, & Lien, 1972; Thelen, Dollinger, & Roberts 1975; Thelen & Kirkland, 1976). It was, therefore, thought that the similarity-attraction framework may provide a useful framework for analysis of vicarious learning from story models.

If similarity is indeed reinforcing (e.g., Byrne & Clore, 1970; Singh, 1974, 1975), then subjects should always imitate a similar model more than a dissimilar one. Result reported by Rosenkrans (1967) is consistent with this proposition. This similarity imitation relationship implies that both boys and girls would imitate the same-sex model more than the opposite-sex model. Similarly, both younger and older children should imitate a same-age model more than an adult model.

Sex of subjects and sex of model studies. Review of literature shows that the relationship between similarity and imitation is not so simple. For example, Grusec and Brinker (1972), who varied sex of subjects and sex of model in one study, discovered that elementary school boys learn more about the behavior of same-sex than opposite sex model, whereas elementary school girls learned

approximately equal from both models. The authors, therefore, concluded that girls were less strongly identified with the female sex-roles. Similar results were obtained with Australian children (Perry & Perry, 1975). These two studies did not deal with any achievement behavior, however.

Findings of a study of achievement behavior, which is of direct relevance to the problem and task considered here, do not present any different picture. For example, McArthur and Eisen (1976) prepared two stories depicting achievement behavior by a boy and achievement behavior by a girl, and reasoned that achievement behavior by the boy would be consistent with the male-stereotypes prevalent in American Society, whereas achievement behavior by girl would represent a case of stereotype-reversal. Boy and girl subjects exposed to these stories would thus show different amount of persistence on an achievement task as in the two stories mentioned above. More specifically, the authors predicted "more achievement oriented behavior by boys hearing the stereotype than those hearing the reversal story and more achievement behavior by girls hearing the reversal than those hearing the stereotype story." (p. 468). The measure of achievement was persistence on a terrarium task.

As predicted, boys persisted on the task longer after exposure to the same-sex (stereotyped) model than after exposure to a reversal

story. Girls, on the other hand, showed equal amount of persistence after exposure to stereotype and reversal story, although there was a nonsignificant tendency in the girls to imitate the reversal model more.

The Sex of subjects x Story book (stereotype versus reversal) effect of the McArthur and Eisen (1976) study can be considered as Sex of subjects x Sex of model effect. If stereotype and reversal stories are considered as same-sex and opposite-sex model for boys and if reversal and stereotype stories are considered same-sex and opposite-sex for girls, then Sex of subjects x Story book interaction really becomes Sex of subjects x Sex of model interaction. Accordingly, interpretation of interaction becomes easier : Boys are more influenced by same-sex than opposite sex model, whereas girls remain unaffected by the sex of model. This result is consistent with the literature on achievement motivation where it has been noted that persistence on task is more meaningful for males than females (cf. Deaux, 1976; Stein & Bailey, 1973). Although the original prediction by McArthur and Eisen (1976) was in line with the prediction from similarity-attraction theory, the results were similar to those by Grusec and Brinker (1972) and by Perry and Perry (1975).

Even though the interpretation suggested above appears meaningful, it is not quite correct to regard the reported interaction as Sex of subjects x Sex of model effect. It deserves mention that the

male and female model of the stereotype and reversal stories were engaged in different set of behaviors. This means that nature of achievement behavior was confounded with the sex of model. Also in both stereotype and reversal stories, another female/male model was present. This makes the interpretation of Sex of subjects x Story book effect as Sex of subject x Sex of model effect ambiguous. The research reported in the present work removes these methodological problems, and provides unambiguous test of Sex of subjects x Sex of model effect.

The Sex of subjects x Sex of model effect obtained in the three studies cited above can be interpreted as consistent with the reinforcement-attraction relationship. Clore and Byrne (1974) have explicitly stated that similarity per se is not important as are its reinforcing properties. When similarity threatens the subjects (Byrne & Lamberth, 1971; Lerner & Agar, 1972; Novak & Lerner, 1968, Taylor & Mettee, 1971) or convey the different meaning (Grush, Clore & Costin, 1975; Handrick & Brown, 1971), then the similarity may not be rewarding at all. How can this apply to the Sex of subjects x Sex of model effect obtained in the three studies reviewed earlier.

The position of the present paper is that achievement behavior is a masculine task where males and females are expected to behave differently. Males who are rewarded to be status-assertive and females who are rewarded to be affiliative thus cannot be expected to behave in a similar way on the task (Deaux, 1976; Sistrunk & McDavid,

1971). Boys should show the usual similarity effect or what Kohlberg (1968) calls the "same-sex chauvinism", but the girls should behave in a similar way with both same-sex and opposite-sex models. If achievement on a masculine task is considered to be sex-inappropriate, and sex-role reversals are penalized (Costrich, Fenstien, Kidder, Mareck, & Pascale, 1975), then females should not engage in any achievement behavior at all whether the model is similar or different. That is, both similarity and dissimilarity are nonreinforcing for them. This would produce a Sex of subjects x Sex of model interaction which seems to have emerged in the McArthur and Eisen (1976) study.

Age of subject and age of models. No consistent effect of age of model on imitation has been reported. In some studies, older models have been imitated more than younger models (Bandura & Walters, 1963; Miller & Dollard, 1941). In other studies, age interacted with other variables in an unpredictable manner (Bandura & Kupers, 1964; Hicks, 1965).

In achievement situations, age of model can be expected to play an important role. As age is considered to be a status variable (Flanders, 1968), more learning can be produced by older than younger model. This is perhaps the reason that all the recent studies of imitation have used adult models only (Bussey & Perry, 1976; Grusec & Brinker, 1972; Perry & Perry, 1975). And one recent study (Abramovitch & Grusec, 1978) which used younger (low status) and older

(high status) models did find the older model to be more imitated than the younger one.

That an older model should produce more learning than a same-age model seems to be reasonable. In a learning situation, similarity in age may not be as reinforcing as would be dissimilarity (Grush et al., 1975). Perhaps the learner thinks that if he is to learn something from the model he must find them to be of higher status. If he is as good as the model is, then how could he learn anything from the model? Such considerations may affect the attention process and hence the vicarious learning. This interpretation of age implies that dissimilarity really indicates model's control over resources (cf. Flanders, 1968, p. 325). A model quite different from the subject with respect to age should thus be imitated more than a same-age model.

Frequent use of child model³₁ in children's readers, however, suggests that perhaps younger children identify themselves with the same-age models. So they are not exposed to adult model as often as to child model. It is also felt that perhaps older children identify themselves with adults. If age serves as a cue for identification, then the prediction of main effect of age in the preceding paragraph may not be obtained. Instead Age of subjects x Age of model interaction would emerge in that younger children would learn more from a same-age than from an adult model, whereas the older

children would learn more from an adult than the same-age model.

Animal and human models. As indicated above, effectiveness of model ^{may} depends upon the age of subjects. That younger children imitate other younger children may be because of the fact that they identify themselves with the children or they find them to be interesting. If the later is the case, then they should imitate animal model more than even children model. This is because they pay more careful attention to the behavior of animals than other models. And attention, as has been mentioned earlier, plays an important role in determining vicarious learning.

The Present Investigation

The main purpose of the present research was to examine how models of stories influence persistence of subjects on a problem-solving task. To accomplish this goal, stories having achievement theme and five different models (crow, boy, girl, man, and woman) were read to children varying in age (4-5 years versus 10-11 years) and their persistence was examined as a function of age of subjects, sex of subjects and nature of model. One prediction was that 4-5 year olds would try longer after exposure to crow than to human models, whereas 10-11 year olds would show the opposite tendency.

The second set of predictions concerned only the four human models -- boy, girl, man, and woman. These four models constituted a 2×2 , Age of model (same-age versus adults) \times Sex of model (same-

sex versus opposite-sex) design. As subjects also varied with respect to their age and sex, the design became a $2 \times 2 \times 2 \times 2$ factorial. In this complex design, relationships between the model and observer with respect to their age and sex were points of main interest. Predictions pertaining to these variables are spelled out below.

On the basis of the status interpretation of age, it was predicted that subject ³ should imitate the adult model more than the same-age model. The identification interpretation, however, suggested that the younger children should show the usual similarity-imitation relationship, while the older children should show a reversal. This implies a significant Age of subject \times Age of model interaction. A strict similarity-imitation interpretation predicts that a same-age model would be imitated more than an adult model.

With respect to the effect of sex of subject and sex of model on persistence, the interaction between the two factors was predicted. More specifically, it was predicted that boys would show the usual similarity-imitation relationship, whereas the girls would not differ in their imitation of same-sex and opposite-sex models. The rationale for this prediction has already been mentioned in the Sex of subjects \times Sex of model subsection.

It should be noted that present work takes up the investigation of the effect of story models on persistence of children in more exhaustive manner than did the study by McArthur and Eisen (1976). Not only ^{does} it remove the confounding of nature of task with

sex of model but also examines persistence on a task completely different from one described in the story. The later precaution is important, for it ensures that the results are not attributable to the artifacts of demand characteristics (Orne, 1965).

CHAPTER 2

MethodSelection and Preparation of Stories

The main story was selected on the basis of cognitive simplicity. Textbooks prescribed by the National Council of Educational Research and Training, New Delhi, were initially consulted to get a story in which trying, effort, and persistence was depicted. The story of a thirsty crow appeared to satisfy this experimental requirement. So, it was selected.

The story goes like this. There was a crow. It was thirsty. While flying, it saw a pitcher. It became very happy and rushed immediately to it. The pitcher however had very little water. It was thus not possible for the crow to reach the water. The crow became at a loss for a while but it did not stop trying. It saw some pebbles at a short distance. It started collecting the pebbles and dropping them into the pitcher. After a great deal of trying, it filled the pitcher with a good number of stones, and so the water came up. The crow was then able to drink water.

A number of teachers were also consulted. Invariably every teacher recommended the above mentioned story. Most of the teachers suggested that collecting stones ⁽⁵⁾ is interesting activity in itself for children. The story of the Thirsty Crow, therefore, became a base and frame for writing other stories.

Four other stories were also written, using a boy, a girl, a man, and a woman as models. In each story, persistence on stone collection remained the major theme, and the model was shown to be successful after a great deal of effort.

A control description was also prepared. This passage was taken from a geography book, Hamari dunia hamara samaj (Part I) published by the National Council of Educational Research and Training, New Delhi. The passage described the state of Uttar Pradesh. It had nothing to do with achievement theme or any modeling effect. It was, however, comparable to other five stories with respect to its length.

*(what about difficulty or interest value)
Are they comparable?*

All the six passages were shown to 10 teachers, and their suggestions for simplifying the stories were considered in revising the stories. All these stories, which were in Hindi, varied in length from 484 to 532 words. They took 3 minutes to 3 minute and 20 seconds in presentation from a tape recorder.¹

All these stories, both the original Hindi and their English translations, are given in Appendix A.

Persistence Task

According to Stein. and Bailey (1973), task persistence is a good index of trying or effort. Trying or effort can, therefore, be

¹ I am extremely grateful to Dr. (Ms.) Leela Krishnan for her help in tape-recording of the stories.

measured in a number of ways — motorally (Bandura & Perloff, 1967; McCoy & Zigler, 1965) by playing games such as putting marbles into a hole (Robinson & Price-Bonham, 1978) or cognitively by problem-solving tasks such as puzzles (Bigner, 1970).

To select the puzzle task, various games were considered. Of all the games, the mad man task prepared and sold by the Wonderland, 41 Park Mension, Park Street, Calcutta, 700 016 was found to be the most appropriate.

The mad man game consisted of four blocks. Each block had six sides with one color circle on each side. The task for the subjects was to arrange the four blocks in such a way that one pillar was built with four different colors on each side.

*really tapping
resistance to help*

The task was tried with a group of fifty graduate students of the Indian Institute of Technology, Kanpur. Of these 50 students, only 6 were able to solve the puzzle when there was no time limit. It was, therefore, felt that the task would be quite difficult for the school children. Subsequently, this task was given to 25 children of a primary school. They all seemed to enjoy it. Also, their teachers felt that task could be interesting for children.

The number of seconds spent on this task constituted the dependent measure of trying in the present research.

Design

The main design was a $2 \times 2 \times 6$ (Age of subjects \times Sex of subjects \times Models) between-subjects factorial, with two levels of age (4-5 vs. 10-11 years), two levels of sex (male vs. female) and six models (crow, boy, girl, man, woman, and control).

Subjects

The subjects were 180 boys and 180 girls from Sunder Model School, Lajpat Nagar, Sunder Model School, Kakader, and the junior section of Guru Nanak Deo Kanya Vidyalaya, Lajpat Nagar, Kanpur, India.² These subjects were selected as prescribed by the Age of subjects \times Sex of subjects design described above. Fifteen subjects were randomly assigned to each of the 24 cells of the design with a constraint that age of the subjects from any age group must not differ across the experimental conditions. The mean age of the so-assigned subjects to the 24 cells is given in Table 1. It can be seen that subjects from each age group did not differ across the six treatment conditions in any noticeable way.

² Thanks are due to Dr. S.S. Kalra for providing me with the facilities for data collection in his schools.

Table 1

Mean Age of Subjects of the Various Treatment Groups (in months)

Subjects	Models					
	Crow	Boy	Girl	Man	Woman	Control
Younger Boys	49.73	50.00	50.53	51.6	50.5	51.63
Younger Girls	50.00	50.33	51.13	51.33	51.13	52.06
Older Boys	123.46	124.73	123.2	124.4	124.0	124.8
Older Girls	124.80	124.85	124.0	125.26	124.2	123.13

Procedure

The procedure involved a number of successive phases. They are described below.

Establishment of rapport. The subject was sent to experimental room by his or her class teacher. Upon arrival, the experimenter, already waiting there, greeted the child and appreciated the attractiveness of his or her name. The experimenter also introduced himself and tried to establish rapport with the subject. All conversation was in Hindi. This method of establishing rapport has been found to be useful in previous work (Gupta, 1979; Singh, Sidana, & Saluja, 1978a, 1978b; Singh, Sidana, & Srivastava, 1978).

Presentation of story. After establishment of rapport, the experimenter informed the subject that he is slightly busy, and so he would begin experiment after some time. Meanwhile subject could listen

to a tape recorder. Depending on the design specification, one of the six descriptions was presented to the subject. The experimenter pretended to be busy while the tape-recorder was on. As soon as the passage was over, the experimenter interfered and asked, "How was it?". After ensuring that the child understood the story, the madman game was introduced. In general, all subjects were able to understand the stories without much difficulty.

Madman task and dependent measure. Immediately after the presentation of the story, the madman task was introduced. The subjects were shown 4 blocks and were asked to name the colored circles printed on those blocks. Once they identified the colors, they were introduced to the real requirement of the madman task. The subjects were told that they would stack four plastic blocks in such a way that every side of the pillar would have all the four different colored circles.

After ensuring that subjects understood the instructions, the actual task was given and a stop watch was set in. The child was allowed to continue on the task for 10 minutes as was done in the study by McArthur and Eisen (1976). Whenever the subject indicated his unwillingness in continuing, the stopwatch was stopped and the time taken was recorded. The time spent on the task constituted the dependent measure of trying by the subject.

*Different interest in task
by age group*

Termination of experiment. Subsequent to the measurement of persistence, the experiment was terminated. The experimenter talked about

the nature of the madman game and listened to the general reaction of subjects. Although most of the subjects thought that the task was interesting, they felt that it was very difficult. To make the subject free from any feelings of failure, the experimenter informed him that the "task is really very difficult; no one has been able to work on it longer than you". Toward the end, the experimenter thanked the subject for his or her cooperation and gave 10 toffees.

CHAPTER 3

Results

Measures of trying (i.e., persistence) on the madman task were subjected to two main analyses. The first analysis examined persistence as a function of age of subjects, sex of subjects, and models. Here the main goal was to find out the most appropriate story model for younger and older boys as well as girls. The second analysis was restricted to the human models alone. The main purpose of this analysis was to find out how characteristics of subjects and those of models interact in determining trying on an achievement task. The two analyses along with the interpretations are presented below.

Age of Subjects x Sex of Subjects x Model Analysis

Table 2 presents summary analysis of variance of a $2 \times 2 \times 6$ [Age of subjects (4-5 vs. 10-11 year olds) x Sex of subjects (boys vs. girls) x Models (crow, boy, girl, man, woman, and control)] between-subject factorial design.

Table 2 shows that only two sources of variance, namely, Models, $F(5, 336) = 9.66, p < .01$ and Age of subjects x Models, $F(5, 336) = 11.29, p < .01$, produced significant results. The main effect of models implies that the model and control condition differed in their effect on persistence. The order of means for the five models and control condition were Animal, $M = 457.00$, Man, $M = 456.05$, Boy, $M = 413.95$, Woman, $M = 412.34$, Girl, $M = 391.9$, and

Table 2

Summary of a 2 x 2 x 6, Age of Subjects x
x Sex of Subjects x Model Analysis of
Variance on Persistence Measure

Source	SS	df	MS	F	r
Age of Subjects (A)	1085.0695	1	1085.069	0.118	.00026
Sex of Subjects (B)	8361.736	1	8361.73	.911	.002
Models (C)	443316.381	5	88663.27	9.664**	.108
A x B	5854.468	1	5854.47	.539	.00142
A x C	517984.5799	5	103596.92	11.29**	.126
B x C	42305.517	5	8461.104	.92	.0103
A x B x C	14928.31	5	2985.562	.325	.00363
Error	3082509.50	336	9174.136		.7488
Total	4115355.66	359			

** $p < .01$

Note. r refers to the proportion of total variance accounted for (see Molls and Williges, 1977 for rationale).

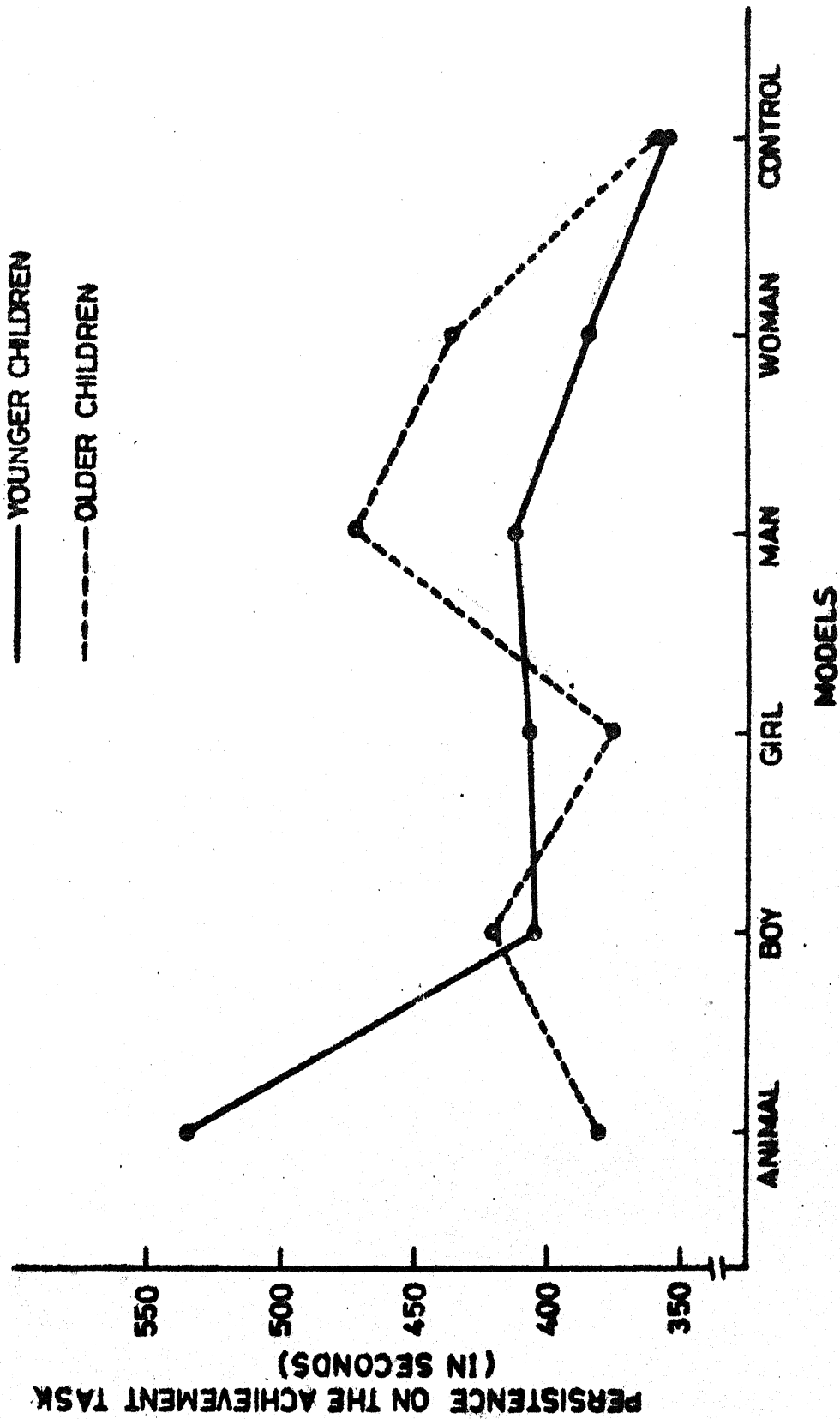


Figure 2. Persistence on the achievement task as a function of age of subjects and nature of model.

Control, $M = 356.70$ in descending order. It is interesting to note that the subjects exposed to the passage without any achievement theme, i.e., control condition, produced least persistence on the achievement task. This indicates that exposure to story models did enhance trying to some extent.

The main effect of model is, however, qualified by the Age of subjects x Model effect. This effect means that the order of effectiveness of the five models and the control condition does not remain the same for the younger and older children.

This point can be appreciated by looking at Figure 2 which plots persistence on achievement task as a function of age of subjects and characteristics of models. The most obvious result is that younger children were more influenced by the crow model than any other four models and control conditions. On the contrary, the older children were more influenced by man than the other models. It is also clear that the younger and older children persisted on the task to the same extent when they were not exposed to any modeling effect under the control condition.

To describe the Age of subjects x Model effect on persistence, two tests of simple effects were made. The first test examined the simple effect of age of subjects at the six levels of model. This analysis tells whether the subjects from two age groups differed significantly in persistence across the six levels of models. The

results are presented in Table 3.

Table 3

Simple Effect of Age of Subjects
at the Levels of Model

Source	SS	df	MS	F
Age of Subjects at Crow Model	342921.60	1	342921.60	37.378**
Age of Subjects at Boy Model	4116.82	1	4116.63	.448
Age of Subjects at Girl Model	14570.42	1	14570.42	1.558
Age of Subjects at Man Model	113796.15	1	113796.15	12.404**
Age of Subjects at Woman Model	43416.60	1	43416.60	4.732*
Age of Subjects for Control	248.07	1	248.07	.027
Error	3082509.60	336	9174.135	

* $p < .05$

** $p < .01$

Note. SS simple effect of age of subjects at the levels of models = 519069.66. This equals SS Age of subjects + SS Age of subjects by model interaction. That is, 1085.069 + 517984.58 = 519069.66. The rationale for this analysis can be found in Winer (1971).

Table 3 shows that the simple effect of age of subjects was present only under the conditions of Crow model, $F(1, 336) = 37.38$, $p < .01$, Man model, $F(1, 336) = 12.40$, $p < .01$, and the Woman model, $F(1, 336) = 4.73$, $p < .05$. The other three models were not susceptible to any age effect.

The second analysis examined whether the effect of model was present in case of both younger and older children. Results from this analysis are summarized in Table 4.

Table 4

Simple Effect of Models at the
Levels of Age of Subjects

Source	SS	df	MS	F
Model on Younger Subjects	554284.825	5	110856.96	12.08**
Model on Elder Subjects	407016.13	5	81403.22	8.87**
Error	3082509.60	336	9174.136	

** $p < .01$

Note. SS simple effect of models at the levels of age of subjects = 961300.95. This equals SS Models + SS Age of subjects by model interaction. That is, $443316.38 + 517984.58 = 961300.96$.

It is clear that younger, $F(5, 335) = 12.08$, $p < .01$, as well as older, $F(5, 336) = 8.87$, $p < .01$, children responded differently across the five models and control conditions.

The analysis presented in Table 4 does not tell the complete story about the manner younger and older children responded to the six treatment conditions. To test the statistical significance of mean differences among six conditions, therefore, Newman-Keuls tests were performed for the younger and older children separately. Tables 5 and 6 record results from the Newman-Keuls tests on persistence score of younger and older children, respectively.

Table 5

Newman-Keuls Test on Persistence Measure
of Younger Children

	Models						r	q _{.95} (r, 336)	n	MS _{Error}
	Control	Woman	Boy	Girl	Man	Crow				
Totals	10641	11564	12170	12224	12376	15978				
10641	-	923	1525	1583	1735	5337*	6		2135.19	
11564	-	-	606	660	812	4414*	5		2040.76	
12170	-	-	-	54	206	3808*	4		1920.10	
12224	-	-	-	-	152	3754*	3		1749.60	
12376	-	-	-	-	-	3502*	2		1461.19	

* $p < .05$

Note. r refers to number of steps the two ordered totals are apart. q_{.95} denotes critical value of each r.

Table 6

Newman-Keuls Test on Persistence
Measure of Older Children

	Models					r	$q_{.95(r, 336)}$	n	MS error
	Control	Girl	Crow	Boy	Woman	Man			
Totals	10763	11289	11442	12607	13178	14989			
10763	-	526	679	1904	2415*	4226*	6	2135.19	
11289	-	-	153	1379	1889	3700*	5	2040.76	
11442	-	-	-	1225	1736	3547*	4	1920.10	
12607	-	-	-	-	511	2322*	3	1749.60	
13178	-	-	-	-	-	1811*	2	1461.06	

* $p < .05$

Note. r refers to number of steps the two ordered totals are apart. $q_{.95}$ denotes critical value of each r.

From the pattern of significant differences, it is quite evident that younger children persist more under the crow than other conditions. Model conditions other than crow did not enhance trying at all. Mean persistence under these conditions was statistically equivalent to that of the control condition. This result, it should be noted, clearly supports the prediction that younger children are more susceptible to modeling effect when animals are shown to be involved in achievement activities. No wonder then that most of the textbooks for younger children include animal models. The present result provides scientific confirmation of the usefulness of this practice.

Results summarized in Table 6 tell how the older children persisted under all the five model and control conditions. The man model resulted in maximum persistence. The woman model also produced significantly greater persistence than the control condition, but the woman model was less effective than the man model.

From the analysis presented so far, it can be said that only the crow model can be used to enhance trying in younger children in an effective way. The most appropriate model for older children is the man model. Effectiveness of models with children appears to be an age-linked phenomenon. Accordingly, use of models in stories designed to enhance achievement behavior should always consider the age of the readers. These results provide clear support for the first prediction.

Characteristics of Subjects x Characteristics of Model Analysis

This analysis included data from only the four human model conditions, because the main purpose was to examine the interrelationship between the characteristics of the subjects and those of models. The data from the control and crow condition were thus not included. Table 7 presents summary analysis of variance for a $2 \times 2 \times 2 \times 2$ (Age of subjects x Sex of subjects x Age of model x Sex of model) between-subject factorial design.

An examination of Table 7 discloses that only four out of the 15 sources of variance produced reliable effect on persistence. These four effects are described below one by one.

Age of subject effect. This effect means that the older children, $\bar{M} = 434.708$, persisted on the achievement task significantly longer, $F(1, 224) = 5.64$, $p < .05$, than the younger, $\bar{M} = 402.796$, subjects. This effect should, however, be accepted with caution, for it was not present in the overall analysis which included all the five models and the control condition (see Table 2).

Age of model effect. Age of model effect indicates that the adult model, $\bar{M} = 434.225$, enabled the subjects to persist on the task for relatively longer period, $F(1, 224) = 5.54$, $p < .05$, than did the same age model, $\bar{M} = 402.913$. This result is consistent with the status interpretation of age, but is opposite to the predic-

Table 7

A 2⁴, Age of Subjects x Sex of Subjects
x Age of Model x Sex of Model Analysis
of Variance of Persistence Measure

Source	SS	df	MS	F	r
Age of <u>ss</u> (A)	59818.84	1	59818.84	5.64*	.02185
Sex of <u>ss</u> (B)	1320.71	1	1320.71	.12	.00048
Age of Model (C)	58812.71	1	58812.71	5.54*	.02148
Sex of Model (D)	30940.11	1	30940.11	2.92	.01130
A x B	6731.00	1	6731.00	.63	.00246
A x C	90575.93	1	90675.93	8.55**	.03312
A x D	1377.30	1	1377.60	.13	.0005
B x C	2975.10	1	2975.10	.28	.00108
B x D	64911.70	1	64911.70	6.12*	.0237
C x D	3596.00	1	3596.00	.34	.0013
A x B x C	1166.01	1	1166.01	.11	.0004
A x B x D	24624.01	1	24624.01	2.32	.0089
A x C x D	6604.51	1	6604.51	.62	.0024
B x C x D	7030.84	1	7030.84	.66	.0026
A x B x C x D	781.20	1	781.20	.07	.0003
Error	2376158.53	224	10607.5		.8679

* $p < .05$

** $p < .01$

Note. r refers to the proportion of total variance accounted for (see Molls and Williges, 1977).

tion of the strict similarity-imitation interpretation.

Age of subjects by age of model effect. Figure 3 plots mean persistence on the achievement task as a function of age of subjects and age of models. This interaction effect is really strong, $F(1, 224) = 8.55$, $p < .01$. This interaction implies that the age of model did not make any significant variation in the persistence of younger children. The mean persistence score under the same age, $M = 406.53$, and adult model, $M = 399.00$, conditions were equivalent. The picture with the older children is, however, different. They persisted longer under the adult model, $M = 469.45$, than the same age model, $M = 399.20$.

These trends received support in the test of simple effect of age of model at the levels of age of subjects. Table 8, which presents results from the simple effect of age of models at the level

Table 8

Simple effect of Age of Model at the
Levels of Age of Subjects

Source	SS	df	MS	F
Age of Model at Younger Subjects	1717.637	1	1717.637	0.16
Age of Model at Older Subjects	147771.006	1	147771.006	13.93**
Error	2376158.53	224	10607.85	

** $p < .01$

Note. SS simple effects of age of model at level of age of subjects = 149488.643. Simple effect = SS Age of Models + (SS Age of Subjects x Age of Models) = 58812.71 + 90675.93 = 149488.64.

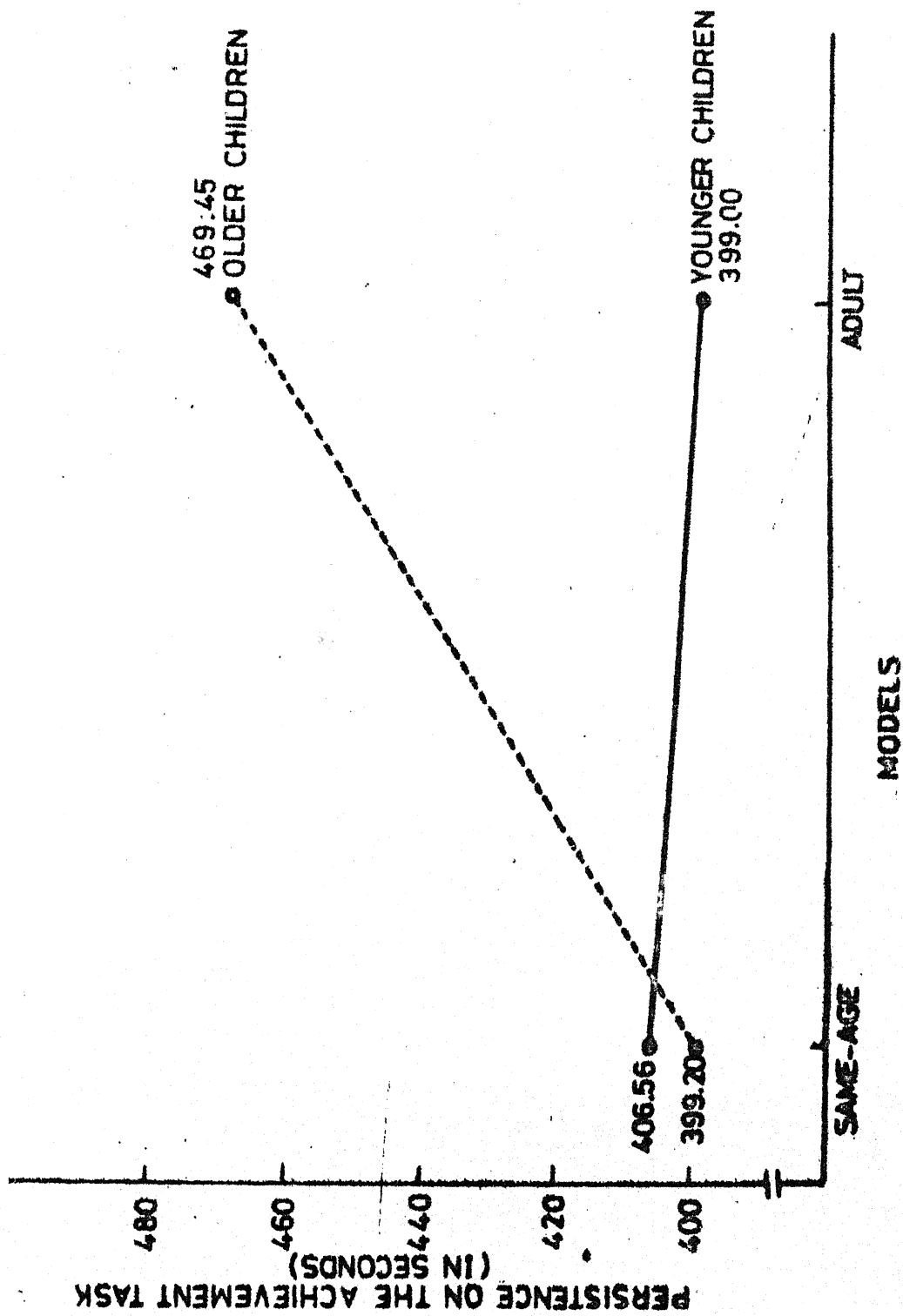


Figure 3. Persistence on the achievement task as a function of age of subjects and age of model.

of age of subjects, bears on the plausibility of the two trends. Age of model did not matter at all to the younger children, $F(1, 224) = 0.16$. In older children, on the contrary, it produced statistically significant difference, $F(1, 224) = 13.91$, $p < .01$.

Table 9 lists results from the second test of simple effect. In this test, the simple effect of age of subjects at the level of the age of models has been examined. As is obvious from Figure 3 also, both the younger and older children responded in identical way to their same-age model, $F(1, 224) = 0.15$. However, the older

Table 9

Simple Effect of Age of Subjects at
the Levels of the Age of Model

Source	SS	df	MS	
Age of Subjects at Same Age Model	1598.7	1	1598.7	0.15
Age of Subjects at Adult Model	148896.075	1	148896.075	14.036**
Error	2376158.53	224	10607.85	

** $p < .01$

Note. SS simple effects of age of subjects at the levels of age of model = 150494.775. Simple effects = (SS Age of Subjects) + (SS Age of Subjects x Age of Models) = 59818.84 + 90675.93 = 150494.77.

and younger children responded to an adult model in completely different way. The older children persisted longer than the younger ones

under the adult model condition, $F(1, 224) = 14.036$, $p < .01$.

The present Age of subjects x Age of model interaction suggests that age of model takes status symbol in case of only 10-11 year olds. Younger children do not follow predictions from either similarity-imitation framework or status framework. Support for the first prediction of the human model design is thus partial.

Sex of subjects x sex of model effect. Figure 4 exhibits mean persistence on the achievement task as a function of sex of subject and sex of model. It appears that boys persisted longer on the achievement task after exposure to a same-sex, $M = 448.7$, than an opposite-sex, $M = 393.17$, model. Girls, on the contrary, persisted longer after exposure to an opposite-sex model, $M = 421.3$, than a same-sex model, $M = 411.3$.

The above interpretation is based on visual inspection of Figure 4. In order to accept this graphic result, it is essential that the interaction effect be decomposed. Test of simple effect of sex of models at the levels of sex of subjects was, therefore, performed. The results obtained are shown in Table 10.

The first interpretation that the boys persisted longer under same-sex than opposite-sex model received statistical support, $F(1, 224) = 8.74$, $p < .01$. The interpretation of the persistence by girls did not receive statistical support, $F(1, 224) = 0.29$. Non-significance of difference indicates that girls persisted on the

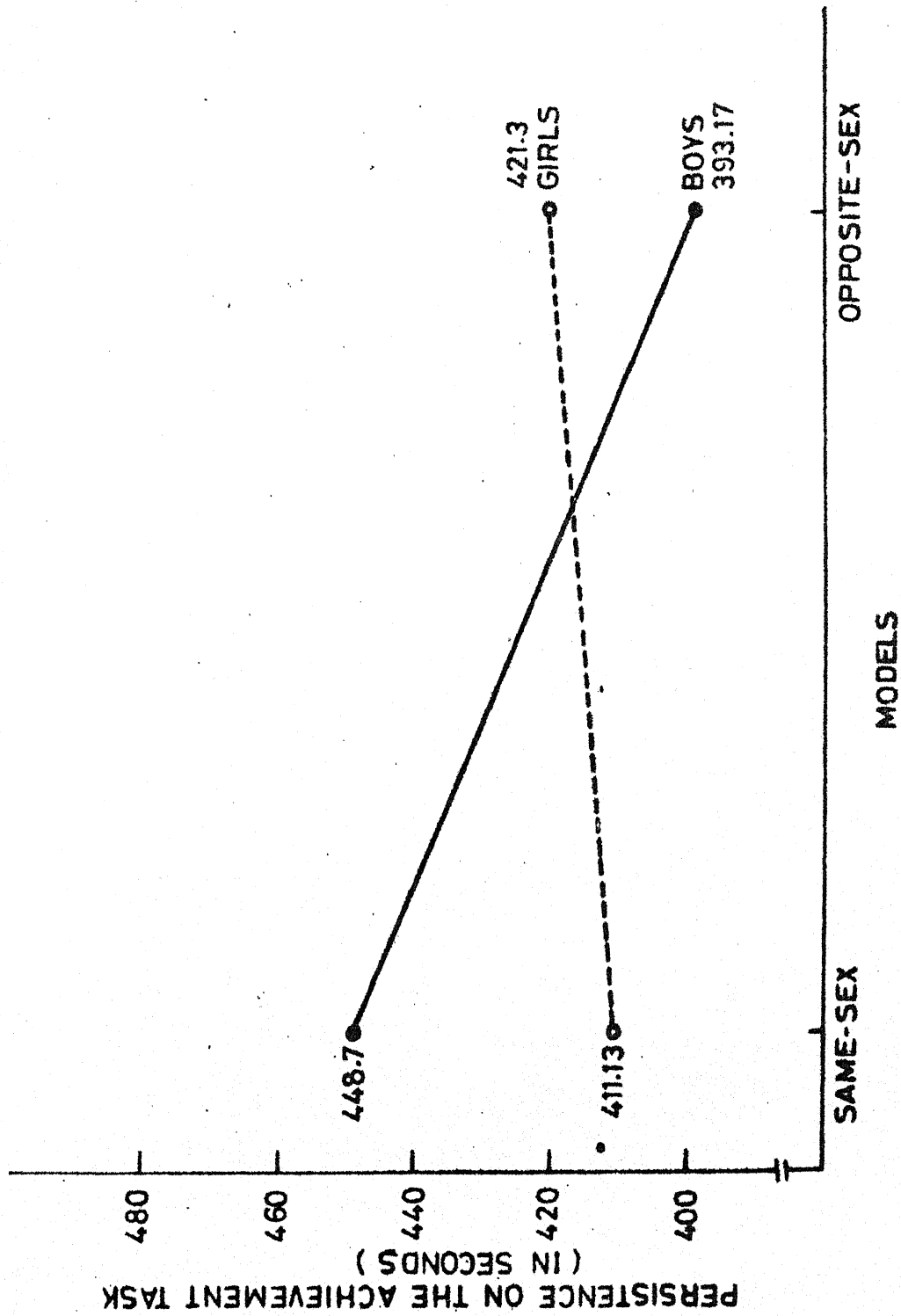


Figure 4. Persistence on the achievement task as a function of sex of subjects and sex of model.

Table 10

Simple Effect of Sex of Model at
the Levels of Sex of Subjects

Source	SS	df	MS	F
Sex of Model on Boys	92740.797	1	92740.80	8.74**
Sex of Model on Girls	3111.005	1	3111.005	0.29
Error	2376158.53	224	10607.85	

** $p < .01$

Note. SS Simple effect of sex of models at the levels of sex of subjects = 95851.802. This equals SS Sex of models + SS Sex of subjects by sex of models interaction. That is, $30940.11 + 64911.70 = 95851.81$.

achievement task under both the same-sex and opposite-sex conditions in the same fashion. The obtained interaction is quite in keeping with the prediction made in Chapter 1.

Table 11 presents simple effect of sex of subjects at the levels of sex of models. The results indicate that boys, $\bar{M} = 448.7$, persisted longer than girls, $\bar{M} = 411.13$, under same-sex model condition, $F(1, 224) = 3.99$, $p < .05$. Under the opposite-sex condition, however, boys, $\bar{M} = 393.7$, and girls, $\bar{M} = 421.3$, showed the same amount of persistence, $F(1, 224) = 2.25$. This result is important, for it shows that girls differ from boys even under the same-sex model. This supports the proposal made earlier that persistence on an achievement task is a masculine activity.

Table 11

Simple Effect of Sex of Subject at
the Levels of Sex of Model

Source	SS	df	MS	F
Sex of Subjects at Same-sex Model	42375.205	1	42375.205	3.99*
Sex of Subjects at Opposite-sex Model	23857.2	1	23857.2	2.249
Error	2376158.53	224	10607.85	

* $p < .05$

Note. SS simple effect of sex of Subjects at the levels of sex of models = 66232.405. This equals SS Sex of subjects + SS Sex of subjects by sex of model interaction. That is, 1320.71 + 64911.70 = 66232.41.

The obtained sex of subject by sex of model interaction is quite consistent with the prediction. The present result, therefore, validates the Sex of Subject x Sex of Model interpretation of the Sex of Subject x Story book interaction obtained by McArthur and Eisen (1976).

Supplementary Analyses

In the analysis reported in Table 7, all the higher order interactions were statistically nonsignificant. Nonsignificance of these higher order interactions can be interpreted as evidence for the generality of the two interactions over the two other factors, for example, sex of subject and sex of model in case of Age of Subject x Age of Model interaction and age of subjects and age of model in case of Sex of subject x Sex of model effect. This is not quite correct as shown below.

Consider the Age of subjects x Age of model interaction. This interaction means that younger boys and girls did not respond at all to the age cue of model, whereas older boys and girls did. Now consider the Sex of subject x Sex of model interaction. This interaction says that boys responded to the sex of model, while girls did not. This interaction implies that boys responded to the sex of model while the girls did not. We had also seen in the first analysis (Table 2) that younger boys and girls did not differ in persistence under the 4 human model conditions, whereas the older boys and girls did differ. Accordingly, the Age of Subject x Sex of Subjects x Sex of Model effect should have been statistically significant. But Table 7 shows that this interaction does not reach the standard .05 level of statistical significance. The sum of squares contributed by this interaction is, however, higher than by other higher order interactions. It was thus felt necessary to look at this interaction more critically.

If the Sex of subject x Sex of model interaction, which is shown in Figure 4, is generalizable across both the younger and older children, then the profile of Sex of Subject x Sex of Model effect should be identical across the two levels of age of subjects. Examination of Figure 5 which plots the profile of Age of Subjects x Sex of Subjects x Sex of Model effect reveals that this is not true. The younger children responded in one way; the older ones responded in a different way. The profile of Sex of subject x Sex of models are thus different for younger and older children.

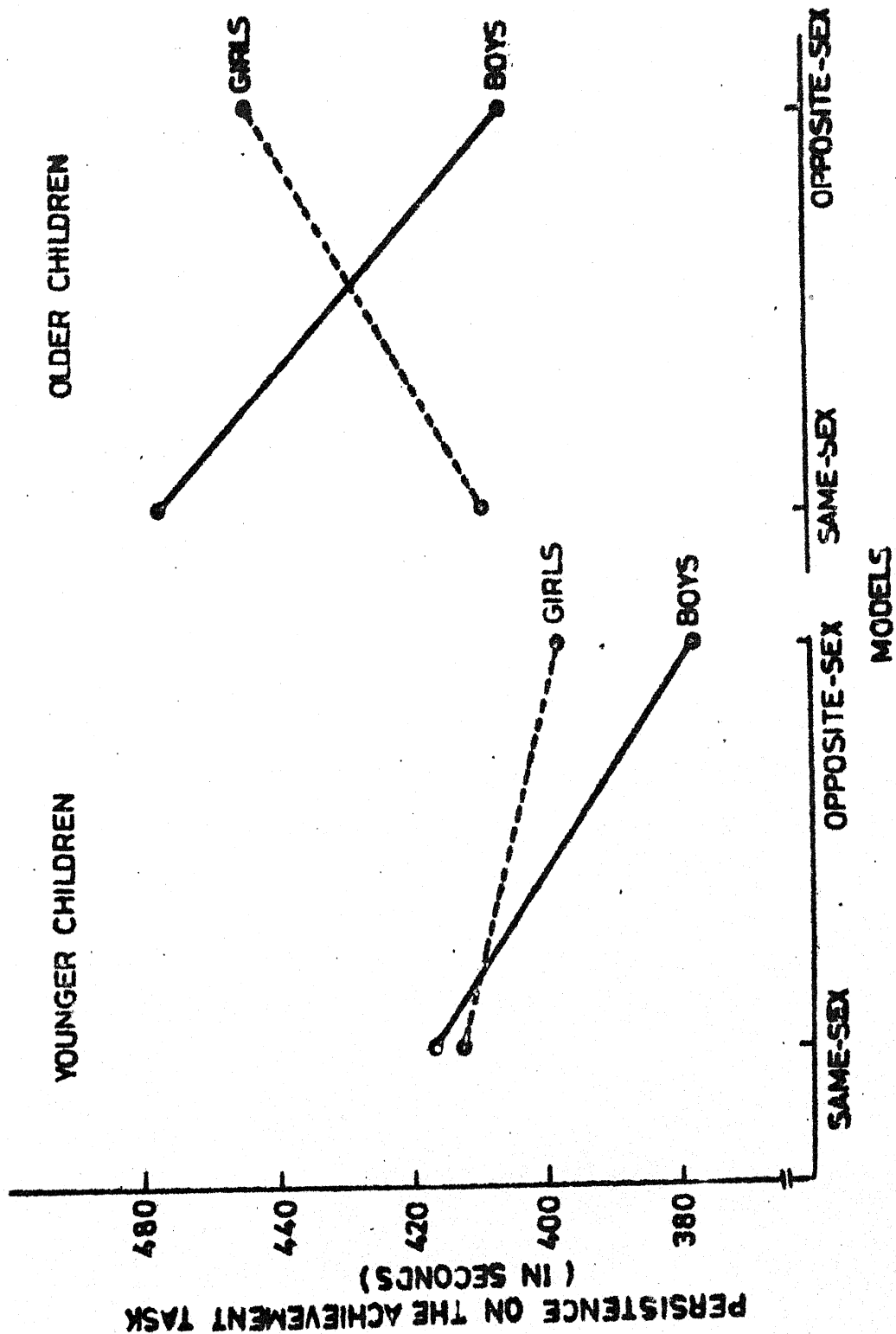


Figure 5. Persistence as a function of age of SS, sex of subjects, and sex of model.

To support the impression of difference in the profiles of the groups, data of younger and older children were analyzed separately, using a 2×2 (Sex of Subject \times Sex of Model) analysis of variance. The results are reported in Table 12.

First, look at the results of younger children. All the three sources of variance fail to produce any noticeable effect. That is, the younger children responded to the male and female model in a similar way. Now look at the results for older children. Here Sex of Subjects \times Sex of Model effect is highly significant. Inspection of the profile of Sex of Subjects \times Sex of Model effect for older children in Figure 5 makes the interpretation of this effect very simple. It is obvious that older boys persisted longer after being exposed to a same-sex than an opposite-sex model. On the contrary, girls appear to have made some cross-sex imitation. This result for girls is very similar to the trend noted by McArthur and Eisen (1976).

Test of simple effect of model on older boys and girls, which are presented in Table 13, however, provided support for differences in case of boys only.

Table 12

Summary Analyses of Variance for Younger and Older Children

Source	df	Younger Children			Older Children		
		SS	MS	F	SS	MS	F
Sex of Subject (A)	1	1044.30	1044.30	0.11	7007.41	7007.41	0.56
Sex of Models (B)	1	22687.50	22687.50	2.36	9630.21	9630.21	0.78
A x B	1	4788.03	4788.03	0.49	84747.68	84747.68	6.86**
Error	116	1114612.54	9608.73		1433188.30	12355.07	

** $p < .01$

Table 13

Simple Effect of Sex of Models
on Older Boys and Girls

Source	SS	df	MS	F
Older Boys	75757.07	1	75757.07	6.13165*
Older Girls	18620.82	1	18620.82	1.5
Error	1433188.30	116	12355.07	

* $p < .05$

Persistence in girls did not differ significantly across the two levels of sex of model. These results suggest that expected three factor interaction is present in the persistence shown by children, but the overall analysis of variance was not able to detect it. Perhaps an overall analysis of variance is not ^avery dependable technique for diagnosing developmental differences (Hale, 1977). This point will be taken up in the next chapter.

From this supplementary analysis, generality of the Sex of Subjects x Sex of Model effect becomes rather limited. The predicted interaction holds true only with the older children. The young children did not obey the prediction at all. Failure of the younger children in this imitation situation is rather surprising in view of the fact that such an effect has been found in other countries (Grusec & Brinker, 1972; Perry & Perry, 1975).

Technical Comments

In the extreme right column of Tables 2 and 7 are reported the proportion of total variance (Moll & Williges, 1977) accounted for by each of the sources. One clear trend in both Tables 2 and 7 is that the treatment variance accounted for very little in the total variation. In the first analysis, the error variance is .75; the treatment variance is just .25. In Table 7, the error variance is .87, the treatment variance again is .13. This trend suggests that the manipulation of model effect was not very effective or else modeling effect from stories is itself very weak. Whatever may be the reason, it is clear that the other sources of variance could not reach the standard level of significance of .05 because of the larger error variance.

CHAPTER 4

DiscussionModel Effect

There are four important findings of the present research. First, younger children try longer when they are exposed to animal model only. Older children, on the contrary, try longer when they are exposed to adult human model than when they are exposed to other models. This result is consistent with the prediction. Perhaps younger and older children find animal and human adult models interesting, and so pay closer attention to their behavior, and behave accordingly.

Second, the older children model their trying more after the adult model than after the same-age models. The original prediction from any of the three frameworks -- similarity-imitation, status interpretation of age, and differential identification -- was not completely substantiated. The main effect of age of model suggested that perhaps the status interpretation of age is correct. The Age of Subject x Age of Model interaction, however, constrained this interpretation. The status interpretation thus received support only in case of older children. Failure of younger children to respond to human model could not be accounted for by any of the three frameworks.

Third, the hypothesized Sex of Subject x Sex of Model effect received a good empirical support. As predicted, boys imitated same-

sex model more than an opposite-sex model, giving evidence for what Kohlberg (1966) calls "same-sex chauvinism" or Byrne (1971) would call "similarity-effect". Girls, in contrast, did not respond differently to the same-sex and opposite-sex models. One interesting finding was that the girls and the boys differed in their imitation even under the same-sex model condition. The girls did not imitate as much as did the boys. This provides support for the proposition that persistence on a task is perhaps a masculine activity. Furthermore, girls did not behave differently under same-sex and opposite-sex model perhaps because of the sex-inappropriateness of the persistence behavior (Costrich et al, 1975; Deaux, 1976).

Finally, there seems to be cultural differences in the imitative behavior of children. While the younger children of the United States (Grusec & Brinker, 1975; McArthur & Eisen, 1976) and Australia (Perry & Perry, 1975) have been found to be susceptible to the modeling effect; the younger children studied in the present research did not show any susceptibility to the human model effect. Studies done across the two cultures are not readily comparable. So the present cultural difference interpretation is admittedly speculative.

Observer and Model Characteristics

The observed Age of Subjects x Age of Model and Sex of Subject x Sex of Model effects are consistent with at least three theories of social psychology. They are considered one by one.

Similarity-attraction theory. As was indicated in Chapter 1, Byrne (1971) expects similarity to determine attraction and other behaviors only to the extent it is rewarding. When similarity turns into punishment, the usual similarity-attraction relationship can no longer be expected. Byrne would thus interpret the failure of girls to imitate more of the behavior of same- than opposite-sex model as attributable to the sex-inappropriateness of the behavior. Since engaging in inappropriate behavior results in penalties (Costrich et al., 1975), it is only appropriate on the part of girls to avoid engaging in sex-inappropriate behavior. The imitation by boys followed the usual similarity-imitation relationship because behaving like a boy is rewarding for boys. According to this framework, a story model can be imitated to the extent that imitation of those behavior would have positive consequences for the readers.

The interpretation for Age of Subjects x Age of Model interaction is not so simple because the younger children did not respond to the age of model at all. Imitation of an adult model (dissimilar model) by older children, however, is quite in keeping with the reinforcement framework. As the adult controls the resources, he can be a good resource person for the learner (Grush, et al., 1975). He can thus be expected to be more attractive than the same-age model, and attraction, as has been shown (Baron, 1970; Rosenkrans, 1967; Thelen et al., 1975), determines imitation to a good deal.

LIBRARY
CENTRAL
65969

Social learning theory. According to social learning theory (Bandura, 1972; Bandura & Walters, 1963; Mischel, 1966), vicarious learning requires attention, retention, motoric reproduction ability and appropriate motivation and incentive for performing in the way the model did. The failure of the younger children to imitate the human model can easily be ascribed to their inability to attend the model. The older children, on the other hand, paid adequate attention to the model, for the adult model is believed to be more rewarding. And so they imitated the adult model more than the same-age model.

The Sex of Subject x Sex of Model interaction obtained with older children can be interpreted in a similar way. This interaction was not present for the younger children, because younger children have limited attentional capacity. In case of older children, this interaction was obtained. Attention mechanism was thus not very critical. The difference in the imitation of boys and girls can be interpreted in terms of their motivation to perform the model behavior. As males prefer status-assertive mode of self-presentation (Deaux, 1976), it is quite natural for boys to engage vigorously in masculine activity such as persistence after exposure to same-sex model than opposite-sex model. Females, who have a tendency to avoid gender-inconsistent behavior (Cherry & Deaux, Note 1) may thus find it appropriate not to perform the behavior. This interpretation presupposes that the learning has already taken place in case of girls.

The two sexes, however, differ in their persistence because the same behavior lead to different consequences for them. The boys are rewarded and the girls are punished. The observed Sex of Subjects x Sex of Model effect is thus interpretable in terms of the motivation and past reinforcement history of the two sexes.

Personality and persuasion. It has long been advocated (Hovland, Janis, & Kelley, 1953) that opinion change is a three-step process: (a) attention to the communication, (b) comprehension of its contents and (c) yielding to what is comprehended. McGuire (1968) has added two further steps: (d) retention of the position agreed with and (e) action in accordance with the written agreement, constituting in all a five-step continuous process.

Let us apply this framework to the Age of Subjects x Age of Model effect. The younger children did not show any model effect because of the difficulty at the first two stages. The older children, however, comprehended the message, but yielded differently under the same-age and different-age models. As adult can be perceived as more credible, it is quite natural for the older children yielding more to an adult than to a same-age model.

The Sex of Subjects x Sex of Model effect can be interpreted in the same way. Since this effect was not obtained with the younger children, difficulty at the level of comprehension can easily account for this. At the level of older children, however, the yielding

mechanism would seem to have operated. Boys yielded to the communication from same-sex model. The girls did not yield to a same-sex or an opposite-sex model because the communication itself was inappropriate or irrelevant. As we have been considering persistence on a problem solving task as a masculine activity, this interpretation has some merit.

Comments. The success of the three theories to account for the present results is commendable. The present results, however, do not help distinguish superiority of any theory. Perhaps what is needed is the test of predictions derived from these theories, using the task studied in the present research.

The result that older children imitate an adult model more than a same-age model can also be interpreted as an ingratiation tactic (Jones, 1964). In fact, this position has already been taken by Abramovitch and Grusec (1978). As adult controls reward, it may be that children imitate them just to flatter them. In the present research, no interaction between model and observer was possible. The effect of age of model on imitation has still been obtained. It seems that present result cannot be attributed to ingratiation tactic by the observers. While ingratiation may be a factor in naturalistic imitation, its contribution to the present finding is rather null.

Implications

Finding reported in the present work have three important implications for enhancing trying. First, the model for achievement behavior should be selected according to the age of the learner. For younger children, particularly 4 to 5 year olds, animals appear to be ^{the} most appropriate model. For older children, in contrast, adult human model seems to promote maximum trying. This relationship between age and model characteristics must be considered while preparing stories for the textbooks for younger and older children. To this, it should be noted that the present practice of using animal models in books for younger children has scientific validity. At the same time, usefulness of human model for textbooks for younger children seems to be questionable.

Incidentally Second, younger children do not respond to the human model at all, while the fact of life that they interact with other human beings more often. It is, therefore, necessary that all precautions be taken to make the theme understandable to younger children. Also, teachers should play an active role making the children understand the story and its implications. Left to themselves, younger children are likely to gain very little from human models.

Finally, unresponsiveness of girls to the models appears to pose a serious problem. When the society is changing rapidly and emphasis is laid on bringing women at par with man, it is quite disturbing that girls show no evidence for trying. This finding calls

for immediate attention from parents as well as school teachers. Perhaps time has come to realize seriousness of this problem and to ensure that achievement task is now no longer a masculine task. It would require that parents, teacher, and other social agents be active in encouraging 'trying' by girls.

Methodological Considerations

Two methodological problems that confronted me in the present research deserve mention. First, overall analysis of variance was not quite able to detect the developmental trends which was actually present in data. Hale (1977) has already called attention to this difficulty. I agree with Hale that the analysis of variance should be replaced by more sensitive techniques such as planned comparisons (Hays, 1973) and trend analysis (Winer, 1971). That would, of course, require ² a priori predictions.

Second, the amount of treatment variance was very little in the experimental data. Most of the variance was attributable to error. This may be because of (a) weak effect of story model, (b) difficulty with the stories employed in the present research, (c) difficulty in the presentation of stories, or (d) difference in nature of the task. As the stories were read by teacher and appropriate methodological cares were taken to ensure that the story was understood by the child, the second and third reasons seem unlikely to me. Of the remaining two probable reasons, it seems that different nature of the task perhaps contributed more than the weak nature

of modeling effect. Since the persistence task was very much different from the task actually shown in the story, the generalizability of the model effect may be low; hence, the lower treatment variance. This possibility can be checked in future research by providing the task similar to the one shown in the story.

Future Research

The present research is only a beginning. A number of variables remain to be studied. These include characteristics of learner such as social background, sex-role identification, locus of control, to mention a few, and characteristics of model such as status and credibility, sex, rewardingness, nurturance, etc.. and the method in which the stories are presented. In the present research, the auditory mode was used. It would be interesting to see how these model characteristics operate when different modes of presentation are used. Two modes of presentation can be given at one time. This would allow the subjects to attend to the stimuli well. This may also improve the comprehension and retention process.

In the present research, measures of only immediate persistence were taken. This was considered appropriate because my principal goal was to see whether story model can enhance trying. To measure the real internalization of trying through the vicarious learning, it is essential to have delayed measure of trying. That would directly bear upon the power of vicarious learning in producing enduring attitudes toward trying.

It should also be worthwhile to employ other types of models. Life and symbolic models, such as film and TV, should be used to enhance trying. Since live and film models operate on more than one sense organ, they can be more effective than the story model considered in present research. It would therefore be worthwhile in future research to study how strongly live, film, and story models determine trying and how long the produced effect lasts.

Other achievement tasks should also be considered. As the present achievement task has turned out to be masculine, other tasks which are feminine or gender-free should be used.

In present research, only two age groups were taken, i.e., 4 - 5 and 10-11 year olds. In future, groups along a continuous age scale such as 3,4,5,6,7,8,9,10 should be studied. Such a continuous age group would help trace the developmental changes in susceptibility to model effects.

Concluding Comments

In his review of the status of developmental psychology in India, Parameswaran (1972) laments that most of the studies in developmental psychology have used survey methods; experimental studies are "conspicuous by their absence". Not only these studies are vague in "discussions of data collected with loosely designed methods on badly selected samples", but also are devoid of any developmental orientation. They are not based on any specific theoretical model either.

Gunta (1979), who studied developmental trend in attribution of performance, suggested that research in cognitive development can be facilitated by using the methods of information integration theory (Anderson, 1974; Singh et al., 1978a; 1978b; Singh et al., 1978). The present work also presents an optimistic outlook. Experimental methods can well very be used in developmental research and predictions derived from theories can readily be tested. Also, their implications for human development can easily be drawn. The author thus hopes that the present work would draw attention of developmental and educational psychologists in India to the power of vicarious learning in enhancing trying.

Reference Note

Cherry, F., & Deaux, K. Fear of success vs fear of gender-inconsistent behavior: A sex similarity. Paper presented at meeting of Mid-Western Psychological Association, Chicago, May, 1975.

References

- Abramovitch, R., & Grusec, J.E. Peer imitation in a natural setting. Child Development, 1978, 49, 60-65.
- Anderson, N.H., & Butzin, C.A. Performance = Motivation x Ability: An integration-theoretical analysis. Journal of Personality And Social Psychology, 1974, 30, 598-604.
- Bandura, A. Vicarious processes : A case of no-trial learning. In Berkowitz (Ed.), Advances in experimental social psychology (Vol. 2). New York: Academic Press, 1965.
- Bandura, A. Principles of behavior modification. New York: Holt, Rinehart, & Winston, 1969.
- Bandura, A. Social learning theory. New York: General Learning Press, 1971.
- Bandura, A., & Huston, A.C. Identification as a process of incidental learning. Journal of Abnormal and Social Psychology, 1961, 33, 311-318.
- Bandura, A., & Kupers, C.J. Transmission of patterns of self-reinforcement through modeling. Journal of Abnormal and Social Psychology, 1964, 69, 1-9.
- Bandura, A., & Perloff, B. Relative efficacy of self-monitored and externally imposed reinforcement systems. Journal of Personality and Social Psychology, 1967, 1, 111-116.
- Bandura, A., Ross, D., & Ross, S.A. Transmission of aggression through imitation of aggressive models. Journal of Abnormal and Social Psychology. 1961, 63, 575-582.
- Bandura, A., Ross, D., & Ross, S.A. Imitation of film-mediated aggressive models. Journal of Abnormal and Social Psychology, 1963 66, 3-11.
- Bandura, A., & Walters, R.M. Social learning and personality development. New York: Holt, 1963.
- Baron, R.A. Attraction toward the model and model's competence as determinants of adult imitative behavior. Journal of Personality and Social Psychology. 1970, 14, 345-351.

- Baron, R.A., & Byrne, D. Social psychology : understanding human interaction (2nd edition). Boston: Allyn & Bacon, 1977.
- Bigner, J. Fathering : Research and practice implication. Family Coordinator, 1970, 19, 357-365.
- Bussey, K., & Perry, G. Sharing reinforcement contingencies with a model : A social learning analysis of similarity effects in imitation research. Journal of Personality and Social Psychology, 1976, 34, 1168-1176.
- Byrne, D. Attitudes and attraction. In L. Berkowitz (Ed.) Advances in experimental social psychology. (Vol. 4). New York: Academic Press, 1969, 35-89.
- Byrne, D. The attraction paradigm. New York: Academic Press, 1971.
- Byrne, D., & Clore G.L. A reinforcement model of evaluative responses. Personality : An International Journal. 1970, 1, 103-128.
- Byrne, D., & Lamberth J. Cognitive and reinforcement theories as complimentary approaches to the study of attraction. In B.I. Murstein (Ed.) Theories of attraction and love. New York: Springer Publication, 1971, 59-84.
- Clore, G.L., & Byrne, D. A reinforcement-affect model of attraction. In T.L. Huston (Ed.) Foundation of interpersonal attraction. New York: Academic Press, 1974.
- Costrich, N., Feinstein, J., Kidder, L., Marecek, J., & Pascale, L. When stereotypes hurt : Three studies of penalties for sex-role reversals. Journal of Experimental Social Psychology, 1975, 11, 520-530.
- Deaux, K. Sex-differences in social behavior. In T. Blass (Ed.) Personality variables in social behavior. Hillsdale, N.J.: Erlbaum, 1976.
- Flanders, J.P. A review of research on imitative behavior. Psychological Bulletin. 1968, 69, 316-337.
- Gerst, M.S. Symbolic coding processes in observational learning. Journal of Personality and Social Psychology, 1971, 19, 7-17.
- Grusec, J.E., & Brinker, D.B. Reinforcement for imitation as a social learning determinant with implications for sex-role development. Journal of Personality and Social Psychology, 1972, 21, 149-158.

- Grusec, J.E., & Mischel W. The model's characteristics as determinants of social learning. Journal of Personality and Social Psychology, 1966, 4, 211-215.
- Grush, J.L., Clore, G.L., & Costin, F. Dissimilarity and attraction: When difference makes a difference. Journal of Personality and Social Psychology, 1975, 32, 783-789.
- Gupta, M. An information integration analysis of developmental trends in attribution of scholastic performance. Unpublished doctoral dissertation, Indian Institute of Technology, Kanpur, India, 1979.
- Hale, G.A. On use of ANOVA in developmental research. Child Development, 1977, 48, 1101-1105.
- Hays, W.A. Statistics for the social sciences. New York: Holt Rinehart, 1973.
- Heider, F. The psychology of interpersonal relations. New York: Wiley, 1958.
- Hendrick, C., & Brown, S.R. Introversion, extraversion, and interpersonal attraction. Journal of Personality and Social Psychology, 1971, 20, 31-35.
- Hicks, D.J. Imitation and retention of film mediated aggressive peer and adult models. Journal of Personality and Social Psychology, 1965, 2, 97-100.
- Hovland, C.I., Janis, I., & Kelley, H. Communication and persuasion. New Haven: Yale University Press, 1953.
- Hull, C.L. Principles of behavior. New York: Appleton-century-crofts, 1943.
- Jones, E.E. Ingratiation : A social psychological analysis, New York: Appleton-Century-Crofts, 1964.
- Kohlberg, L.A. Cognitive developmental analysis of children's sex-role concepts and attitudes. In E.E. Maccoby (Ed.), The development of sex differences, Stanford, Calif., : Stanford University Press, 1964.

- Kun, A., Parsons, J.E., & Ruble, D.N. Development of integration process using ability and effort information to predict outcome. Developmental Psychology, 1974, 10, 721-731.
- Lerner, M.J., & Agar, E. The consequences of perceived similarity : Attraction and rejection, approach and avoidance. Journal of Experimental Research in Personality, 1972, 6, 69-75.
- Maccoby, E.E. Role taking in childhood and its consequences for social learning. Child Development, 1959, 30, 239-252.
- Maccoby, E.E., & Wilson, W.C. Identification and observational learning from films. Journal of Abnormal and Social Psychology, 1957, 55, 76-87.
- McArthur, L.Z., & Eisen, S.V. Achievement of male and female story-book character as determinants of achievement behavior by boys and girls. Journal of Personality and Social Psychology, 1975, 33, 467-473.
- McCoy, N., & Zigler, E. Social reinforcer effectiveness as a function of the relationship between child and adult. Journal of Personality and Social Psychology, 1955, 1, 604-612.
- McGuire, W.J. Personality and susceptibility to social influence. In E.E. Borgotta & W.W. Lambert (Eds.), Handbook of personality theory and research. Chicago: Rand McNally, 1968.
- Miller, N.E., & Dollard, J. Social learning and imitation. New Haven: Yale University Press, 1941.
- Mischel W. A social learning view of sex differences in behavior. In E.E. Maccoby (Ed.), The development of sex differences. Stanford, Calif.: Stanford University Press, 1966.
- Moll, J.D., & Williges, R.C. Motion versus pattern cues in visually time-compressed target detection in static noise. Journal of Applied Psychology, 1977, 62, 96-103.
- Murphy, L.B. Routes of tolerance and tension in Indian child development. In G. Murphy (Ed.) In the minds of men. New York: Basic Books, 1953.
- Novak, D.W., & Lerner, M.J. Rejection as a consequence of perceived similarity. Journal of Personality and Social Psychology, 1968, 9, 147-152.

- Orne, M.T. On the social psychology of the psychological experiment : With particular reference to demand characteristics and their implications. American Psychologists, 1962, 17, 776-783.
- Parameswaran, E.G. Developmental psychology : A trend report. In S.K. Mitra (Ed.) A survey of research in psychology. Bombay: Popular prakashan, 1972, 56-79.
- Perry, D.G., & Perry, L.C. Observational learning in children : Effects of sex of models and subjects' sex-role behavior. Journal of Personality and Social Psychology, 1975, 31, 1083-1088.
- Robinson, L.L., & Price-Bonham, S. Fathers' reinforcement and task persistence of young children. Journal of Psychology, 1978, 99, 83-91.
- Rosenkrans, U.A. Imitation in children as a function of perceived similarity to a social model and vicarious reinforcement. Journal of Personality and Social Psychology, 1967, 7, 307-315.
- Singh, R. Reinforcement and attraction : Specifying the effects of affective states. Journal of Research in Personality, 1974, 8, 294-305.
- Singh, R. Reinforcement, affect, and interpersonal attraction. Psychologia, 1975, 18, 142-148.
- Singh, R., Gupta, M., & Dalal, A.K. Cultural difference in attribution of performance : An integration-theoretical analysis. Journal of Personality and Social Psychology, 1979, 37, 1342-1351.
- Singh, R., Sidana, U.R., & Saluja, S.K. Integration theory applied to judgment of personal happiness by children Journal of Social Psychology, 1978, 105, 23-27.
- Singh, R., Sidana, U.R., & Saluja, S.K. Playgroup attractiveness studied with information integration theory. Journal of Experimental Child Psychology, 1978, 25, 429-436.
- Singh, R., Sidana, U.R., & Srivastava, P. Averaging processes in children's judgment of happiness. Journal of Social Psychology, 1978, 104, 123-132.

- Sinha, J.B.P. Development through behavior modification. Calcutta: Allied, 1970.
- Sinha, J.B.P., & Pandey, J. Reinforcement and models' efficiency as factors in decision making of dependence-prone persons. Indian Journal of Psychology, 1975, 50, 49-57.
- Sistrunk, F., & McDavid, J.W. Sex variable in conformity behavior. Journal of Personality and Social Psychology, 1971, 17, 200-207.
- Skinner, B.F., Science and human behavior. New York: MacMillan, 1953.
- Smith, R.E., Smith, L., & Lien, D. Inhibition of helping behavior by a similar or dissimilar non-reactive fellow bystander. Journal of Personality and Social Psychology, 1972, 23, 414-419.
- Stein, A.H., & Bailey, M.M. The socialization of achievement orientation in females. Psychological Bulletin. 1973, 8, 345-366.
- Taylor, S.E., & Mettee, D.R. When similarity breeds contempt. Journal of Personality & Social Psychology, 1971, 20, 75-81.
- Thelen, M.H., Dollinger, S.J., & Roberts, M.C. On being imitated : Its effects on attraction and reciprocal imitation. Journal of Personality and Social Psychology, 1971, 20, 75-81.
- Thelen, M.H., & Kirkland, K.D. On status of being imitated : Effects on reciprocal imitation and attraction. Journal of Personality and Social Psychology, 1975, 33, 691-697.
- Winer, B.J., Statistical principles in experimental design (2nd Edition). New York: McGraw-Hill, 1971.
- Winter, S.k. Case studies. In D.C. McClelland & D.G. Winter (Eds.) Motivating economic achievement. New York: Basic Books, 1969.

APPENDIX

APPENDIX A-1

The six passages which included crow, boy, girl, man, woman, and no model are presented here in their original form.

Crow Model

एक कौआ अपने माता - पिता के साथ एक पेड़ पर रहता था । वह अभी बच्चा ही था । माता - पिता घर से बाहर जाने से पहले उस कौआ को मना कर जाते थे कि वह घर से बाहर न निकले ।

एक बार की बात है । गर्मी का मौसम था । उस कौआ के माता - पिता सुबह ही भोजन की तलाश में बाहर निकल गये थे । जाने समय उसे वे कह गये कि वह घर से बाहर न निकले । उनका कहना मानकर वह चुपचाप घर में ही बैठा रहा ।

काफी देर तक वह यूँ ही बैठा रहा । दोपहर हो गयी थी । लू भी चल रही थी पर उसके माता पिता अभी तक लौटकर नहीं आये थे । उसे काफी जोर से प्यास लग रही थी । आस-पास में पानी नहीं था । उसे लगा कि अगर उसे पानी नहीं मिलता तो वह प्यास से मर जायेगा । उसने काफी देर तक अपने माता - पिता का इन्तजार किया । पर वे नहीं आये । अतः उसने सोचा कि आस-पास कहीं से पानी पीकर वह वापिस अपने घर माता - पिता के आने से पहले ही लौट आयेगा ।

वह घर से बाहर निकल कर पानी की तलाश में उड़ा । तेज धूप और लू में उसका शरीर झुलसने लगा था । एक बार तो उसकी इच्छा हुई कि वह वापिस लौट जाये , पर उसे प्यास बहुत जोर की लग रही थी अतः पानी उसके लिये बहुत जरूरी था । उसने चारों ओर देखा तो सब ओर सूखा ही सूखा था । वह उड़ता रहा । सब नदी , नाले और तालाब सूख गये थे । पानी कहीं भी दिखायी नहीं पड़ता था ।

कौआ उड़ता - उड़ता एक बाग में पहुँचा । वहाँ एक मटका रखा था । कौआ बहुत खुश हुआ । वह मटके पर आ बैठा । पर जब उसने देखा कि मटके में पानी बहुत कम है तो वह निराश हुआ । पानी तक उसकी चोंच नहीं पहुँच रही थी ।

अचानक उसके दिमाग में एक बात आई । कुछ दूर पर कंकड़ों का एक ढेर पड़ा था । उसने सोचा कि अगर वह घड़े में कंकड़ों को चुन चुन कर डाले तो शायद पानी ऊपर आ जाये और वह पानी पी पाये ।

वह दूर से कंकड़ ला - ला कर घड़े में डालने लगा । कुछ ही कंकड़ डालने के बाद वह थक गया । गर्मी तथा प्यास के मारे वह हाँफने लगा । उसने घड़े में झुक कर देखा पर पानी के तल में दो चार पत्थरों से कोई अन्तर नहीं पड़ा था ।

कौये को पता था कि हिम्मत हारने पर वह प्यासा मर सकता है । इसलिये वह थका होने पर भी कंकड़ लाकर डालता रहा । सारे कंकड़ खत्म हो गये थे पर पानी अभी भी पहुँच से बाहर था । ऐसा लगता था कि बस कुछ और कंकड़ डालने से पानी ऊपर आ जाये ।

वह फिर हिम्मत कर इधर - उधर से कंकड़ ढूँढ़कर घड़े में डालने लगा इस बार पानी काफी ऊपर आ गया था । कौये की चोंच आसानी से पानी तक पहुँच गयी । उसने खूब जी भर कर पानी पिया और खुशी से काँव - काँव करता उड़ गया ।

— x —

Boy Model

रामू अपने माँ - बाप का अकेला लड़का था । वह पढ़ने लिखने में अच्छा तथा बहादुर था । वे लोग एक पहाड़ पर रहते थे । वहाँ पर पूरी साल बरसात ही रहती थी । तूफान भी बहुत आया करते थे ।

एक रात जब वे लोग सोये हुए थे तो अचानक तूफान आ गया । आस-पास चीख पुकार मच गयी । लोग घरों से निकल कर भागने लगे । रामू भी अपने माता - पिता के साथ भागा पर भागने में साथ छूट जाने पर बिछुड़ गया ।

रात अंधेरी थी । चारों ओर चीख पुकार मची हुयी थी । उसने अपने माता - पिता को पुकारा पर तूफान के तेज शोर में उसकी आवाज किसी को सुनाई नहीं दी । तूफान बहुत तेज था । कुछ देर तक वह तेज हवा में अपने आप को संभाले रहा पर अचानक तेज हवा ने उसे लड़खड़ा दिया । वह तूफान के साथ उड़ा और पता नहीं तूफान ने उसे कहाँ पटक दिया । चोट लगने पर वह बेहोश हो गया ।

होश में आने पर उसने देखा कि सुबह हो गयी है और वह एक खाई में पड़ा है । खाई बहुत गहरी थी । उसने ईश्वर को धन्यवाद दिया कि वह जीवित था । खाई में से उसने सहायता के लिये आवाज लगाई पर आस पास कोई सुनने वाला था ही नहीं । उदास होकर वह कोई उपाय सोचने लगा ।

अचानक उसके दिमाग में एक बात आई । खाई में काफी पत्थर पड़े थे । अगर उन पत्थरों को एक स्थान पर एकत्र किया जाय तो वह उन पर चढ़कर खाई से बाहर आ सकता था पर यह मुश्किल काम था ।

उसने पत्थर लाना आरम्भ किया । छोटे बड़े पत्थर ला - ला कर वह इकट्ठा करता रहा । कुछ ऊँचा ढेर हो जाने पर उसने चढ़कर देखा । अभी दीवार काफी ऊँची थी ।

वह काफी थक गया था । भूख भी बहुत जोर की लग रही थी । सूरज भी काफी ऊपर आ गया था । वह पसीने से तर बतर था पर उसने हिम्मत न हारी । थोड़ी देर आराम करने के बाद वह फिर पत्थर इकट्ठा करने लगा । वह बड़े- बड़े पत्थरों को लुढ़का कर लाने लगा । पत्थरों को जमा करने के बाद उसने फिर ढेर पर छड़ा होकर देखा । दीवार का सिरा अब भी काफी दूरी पर था ।

थोड़ी देर आराम करने के बाद उसने फिर कोशिश की । आस पास के सभी पत्थर खत्म हो गये थे । वह दूर दूर से पत्थर लाकर जमा करने लगा । अब ढेर काफी ऊँचा हो गया था पर इस बार भी कुछ पत्थर कम पड़ गये ।

भूख प्यास से बेहाल रामू ने फिर प्रयास किया । अब उसे दो चार पत्थर और लाने थे । पत्थरों को लाने के लिये उसे इस बार काफी दूर जाना पड़ा

वह बहुत बुरी तरह थक गया था पर वह निराश नहीं हुआ । इस बार पत्थर लाने में वह गिर गिर जाता था । पर उसकी मेहनत बेकार नहीं गयी । इस बार पत्थरों के ढेर पर चढ़कर वह छ़ाई से बाहर आ गया ।

छ़ाई से बाहर आने पर उसे दूर पर अपना गाँव दिखायी देने लगा । कुछ देर चलने पर उसे अपने माता - पिता तथा गाँव के अन्य लोग मिल गये जो उसी को ढूँढ़ रहे थे । उसको देखकर उसके माता - पिता बहुत खुश हुए तथा उसकी हिम्मत की बहुत प्रशंसा की ।

—X—

Girl Model

रीमा अपने माता - पिता की अकेली लड़की थी । वह पढ़ने लिखने में अच्छी तथा बहादुर थी । वे लोग एक पहाड़ पर रहते थे । वहाँ पर पूरी साल बरसात ही रहती थी । तूफ़ान भी बहुत आया करते थे ।

एक रात जब वे लोग सोये हुए थे तो अचानक तूफ़ान आ गया । आस - पास चीख पुकार मच गयी । लोग घरों से निकल कर भागने लगे । रीमा भी अपने माता पिता के साथ भागी , पर भागते में माँ का साथ छूट जाने से वह बिछुड़ गयी ।

रात अंधेरी थी । चारों ओर चीख पुकार मची हुयी थी । उसने अपने माता पिता को पुकारा , पर तूफ़ान के तेज शोर में उसकी आवाज किसी को सुनायी नहीं दी । तूफ़ान बहुत तेज था । कुछ देर तक वह तेज हवा में अपने आप को संभाले रही पर अचानक तेज हवा ने उसे लड़खड़ा दिया । वह तूफ़ान के साथ उड़ी और पता नहीं तूफ़ान ने उसे कहाँ पटक दिया । चोट लगने पर वह बेहोश हो गयी ।

होश में आने पर उसने देखा कि सुबह हो गयी है और वह एक छ़ाई में पड़ी है । छ़ाई काफी गहरी थी । उसने ईश्वर को धन्यवाद दिया कि वह जीवित थी । छ़ाई में से उसने सहायता के लिये आवाज लगाई पर आस - पास सुनने वाला

कोई था ही नहीं । उदास होकर वह कोई उपाय सोचने लगी ।

अचानक उसके दिमाग में एक बात आयी । छाई में काफी पत्थर पड़े थे । अगर उन पत्थरों को एक स्थान पर एकत्र किया जाये तो वह उन पर चढ़कर छाई से बाहर आ सकती थी पर यह मुश्किल काम था ।

उसने पत्थर लाना प्रारम्भ किया । छोटे - बड़े पत्थर ला लाकर वह इकट्ठा करती रही । कुछ ऊँचा ढेर हो जाने पर उसने चढ़कर देखा । अभी दीवार काफी ऊँची थी ।

वह काफी थक गयी थी । भूख भी बहुत जोर की लग रही थी । फिर सूरज भी काफी ऊपर आ गया था । वह पसीने से तर - बतर थी । पर उसने हिम्मत न हारी । थोड़ी देर आराम करने के पश्चात् वह फिर पत्थर इकट्ठा करने लगी । वह बड़े - बड़े पत्थरों को लुढ़का कर लाने लगी । पत्थरों के जमा करने के बाद उसने फिर ढेर पर छड़ा होकर देखा । दीवार का सिरा अब भी दूरी पर था ।

थोड़ी देर आराम करने के पश्चात् उसने फिर कोशिश की । आस-पास के सभी पत्थर छत्र हो गये थे । अब वह दूर दूर से पत्थर लाकर जमा करने लगी । अब ढेर काफी ऊँचा हो गया था । पर इस बार भी कुछ पत्थर कम पड़े गये ।

भूख प्यास से बेहाल रीमा ने फिर से प्रयास किया । अब उसे दो-चार पत्थर और लाने थे । पत्थरों को लाने के लिये उसे इस बार काफी दूर जाना पड़ा । वह बहुत बुरी तरह थक गयी थी पर वह निराश नहीं हुयी । इस बार पत्थर लाने में वह गिर गिर जाती थी । पर उसकी मेहनत बेकार नहीं गयी । इस बार पत्थरों के ढेर पर चढ़कर वह छाई से बाहर आ गयी ।

छाई से बाहर आने पर उसे दूर पर अपना गाँव दिखायी देने लगा । कुछ दूर चलने पर उसे अपने माता - पिता तथा गाँव के अन्य लोग मिल गये जो उसी को ढूँढ़ रहे थे । उसको देखकर उसके माता - पिता बहुत खुश हुये तथा उसकी हिम्मत की बहुत प्रशंसा की ।

Man Model

एक गाँव में श्याम नाम का एक आदमी रहता था । वह बहुत अच्छा व मेहनती था । उसके दो बच्चे थे । वे लोग एक पहाड़ पर रहते थे । वहाँ पर पूरी साल बरसात ही रहती थी । तूफान भी बहुत आया करते थे ।

एक रात जब वे लोग सोये हुए थे तो अचानक तूफान आ गया । आस - पास चीख पुकार प्रचल गयी । लोग घरों से निकल कर भागने लगे । श्याम भी अपने बच्चों के साथ भागा । पर भागते में बच्चे भीड़ में बिछुड़ गये ।

रात अंधेरी थी । चारों ओर चीख पुकार सची हुयी थी । उसने अपने बच्चों को पुकारा पर तूफान के तेज शोर में उसकी आवाज किसी को सुनायी नहीं दी । तूफान बहुत तेज था । कुछ देर तक वह तेज हवा में अपने आपको संभाले रहा पर अचानक तेज हवा ने उसे लड़खड़ा दिया । वह तूफान के साथ उड़ा और पता नहीं तूफान ने उसे कहाँ पटक दिया । चोट लगने पर वह बेहोश हो गया ।

होश में आने पर उसने देखा कि सुबह हो गयी है और वह एक खाई में पड़ा है । खाई काफी गहरी थी । उसने ईश्वर को धन्यवाद दिया कि वह जीवित था । खाई में से उसने सहायता के लिये आवाज लगायी पर आस - पास सुनने वाला कोई था ही नहीं । उदास होकर वह कोई उपाय सोचने लगा । उसे बच्चों की चिन्ता भी थी ।

अचानक उसके दिमाग में एक बात आई । खाई में काफी पत्थर पड़े थे । अगर उन पत्थरों को एक स्थान पर एकत्र किया जाये तो वह उन पर चढ़कर खाई से बाहर आ सकता था पर वह काफी मुश्किल काम था ।

उसने पत्थर लाना प्रारम्भ किया । छोटे - बड़े पत्थर ला - ला कर वह इकट्ठा करता रहा । कुछ ऊँचा ढेर हो जाने पर उसने चढ़कर देखा । अभी दीवार काफी ऊँची थी ।

वह काफी थक गया था । भूख भी बहुत जोर की लग रही थी ।

फिर सूरज भी काफी उमर आ गया था । वह पसीने से तर बतर था पर उसने हिम्मत न हारी । थोड़ी देर आराम करने के पश्चात् वह फिर पत्थर इकट्ठा करने लगा । वह बड़े बड़े पत्थरों को लुढ़का कर लाने लगा । पत्थरों को जमा करने के बाद उसने फिर ढेर पर खड़ा होकर देखा । दीवार का सिरा अब भी दूरी पर था ।

थोड़ी देर आराम करने के बाद उसने फिर कोशिश की । आस-पास के सभी पत्थर खत्म हो गये थे । अब वह दूर दूर से पत्थर लाकर जमा करने लगा । अब ढेर काफी ऊँचा हो गया था पर इस बार भी कुछ पत्थर कम पड़ गये ।

भूख प्यास से बेहाल श्याम ने फिर कोशिश की । अब उसे दो-चार पत्थर और लाने थे ; पत्थरों को लाने के लिये उसे काफी दूर जाना पड़ा । वह बहुत बुरी तरह थक गया था पर वह निराश नहीं हुआ । इस बार पत्थर लाने में वह बार बार गिर पड़ता था पर उसकी मेहनत बेकार नहीं गयी । इस बार पत्थरों के ढेर पर चढ़कर वह छाई से बाहर आ गया ।

छाई से बाहर आने पर उसे दूर पर अपना गाँव दिखाई देने लगा । कुछ दूर चलने पर उसे अपने बच्चे तथा गाँव के दूसरे आदमी मिल गये । अपने पिता को देखकर बच्चे बहुत खुश हुये । गाँव वालों ने उसकी बहुत प्रशंसा की ।

— × —

Woman Model

एक गाँव में राधा नाम की एक औरत रहती थी । वह बहुत अच्छी व मेहनती औरत थी । उसके दो बच्चे थे । वे लोग एक पहाड़ पर रहते थे । वहाँ पर पूरी साल बरसात ही रहती थी । तूफान भी बहुत आया करते थे ।

एक रात जब वे लोग सोये हुये थे तो अचानक तूफान आ गया ।

आस - पास चीख पुकार मच गयी । । लोग घरों से निकल कर भागने लगे । राधा भी अपने बच्चों के साथ भागी । पर भागते में बच्चे भीड़ में बिछुड़ गये ।

रात अंधेरी थी । चारों ओर चीख पुकार मची हुयी थी । उसने अपने बच्चों को पुकारा पर तूफान के तेज शोर में उसकी आवाज किसी को सुनायी नहीं दी । तूफान बहुत तेज था । कुछ देर तक वह तेज हवा में अपने आपको संभाले रही पर अचानक तेज हवा ने उसे लड़खड़ा दिया । वह तूफान के साथ उड़ी और पता नहीं तूफान ने उसे कहाँ पटक दिया । चोट लगने पर वह बेहोश हो गयी ।

होश में आने पर उसने देखा कि सुबह हो गयी है और वह एक खाई में पड़ी है । खाई काफी गहरी थी । उसने ईश्वर को धन्यवाद दिया कि वह जीवित थी । खाई में से उसने सहायता के लिये आवाज लगायी पर आस - पास सुनने वाला कोई था ही नहीं । उदास होकर वह कोई उपाय सोचने लगी । उसे अपने बच्चों की चिन्ता भी थी ।

अचानक उसके दिमाग में एक बात आयी । खाई में काफी पत्थर पड़े थे । अगर उन पत्थरों को एक स्थान पर एकत्र किया जाये तो वह उन पर चढ़कर खाई से बाहर आ सकती थी पर वह काफी मुश्किल काम था ।

उसने पत्थर लाना आरंभ किया । छोटे - बड़े पत्थर ला ला कर वह इकट्ठा करती रही । कुछ ऊँचा ढेर हो जाने पर उसने चढ़कर देखा । अभी दीवार काफी ऊँची थी ।

वह काफी थक गयी थी । थूँख भी बहुत जोर की लग रही थी । फिर सूरज भी काफी ऊपर आ गया था । वह पसीने से तर बतर थी । पर उसने हिम्मत न हारी । थोड़ी देर आराम करने के बाद वह फिर पत्थर इकट्ठा करने लगी । वह बड़े - बड़े पत्थरों को लुढ़का कर लाने लगी । पत्थरों को जमा करने के बाद उसने फिर ढेर पर छड़ा होकर देखा । दीवार का सिरा अब भी दूरी पर था ।

थोड़ी देर आराम करने के बाद उसने फिर कोशिश की । आस - पास के सभी पत्थर खत्म हो गये थे । अब वह दूर दूर से पत्थर लाकर जमा करने लगी । अब ढेर काफी ऊँचा हो गया था पर इस बार भी कुछ पत्थर कम पड़े गये ।

भूख प्यास से बेहाल राधा ने फिर कोशिश की । अब उसे दो - चार पत्थर और लाने थे । पत्थरों को लाने के लिये उसे इस बार काफी दूर जाना पड़ा । वह बहुत बुरी तरह थक गयी थी पर वह निराश नहीं हुई । इस बार पत्थर लाने में वह बार बार गिर पड़ती थी पर उसकी मेहनत बेकार नहीं गयी । इस बार पत्थरों के ढेर पर चढ़कर वह छाई से बाहर आ गयी ।

छाई से बाहर आने पर उसे दूर पर अपना गाँव दिखाई देने लगा । कुछ देर चलने पर उसे अपने बच्चे तथा गाँव के दूसरे आदमी मिल गये । अपनी माँ को देखकर बच्चे बहुत खुश हुये । गाँव वालों ने उसकी बहुत प्रशंसा की ।

—x—

No Model

हमारे राज्य का नाम उत्तर प्रदेश है । फैलाव की दृष्टि से भारत के दो राज्य ही इससे बड़े हैं । इसकी आबादी सब राज्यों की आबादी से अधिक है । हमारे राज्य में नौ करोड़ से अधिक लोग रहते हैं ।

भारत के इतिहास की बहुत बड़ी - बड़ी घटनायें इसी उत्तर - प्रदेश में घटी हैं । इसी प्रदेश के अयोध्या नगर में राम का और मथुरा नगर में कृष्ण का जन्म हुआ था । अपने राज्य के सारनाथ नामक नगर में बुद्ध ने अपना पहला उपदेश दिया था ।

बढ़ीनाथ , केदारनाथ , वाराणसी , इलाहाबाद , मथुरा तथा अयोध्या हिन्दुओं के ऐसे धार्मिक स्थान हैं । भारत के कोने - कोने से लोग

यात्रा के लिये आते हैं । आगरे के ताज महल को देखने सारे संसार के लोग आते हैं ।

तुमने महारानी लक्ष्मी बाई का नाम सुना होगा । देश की आजादी के लिये ये अंग्रिजों से लड़ी थीं । इतिहास में ये झांसी की रानी के नाम से प्रसिद्ध हैं ।

अपने प्रदेश का उत्तरी भाग पहाड़ी है । पहाड़ों की ऊँचाई पाँच हजार मीटर और कहीं - कहीं सात हजार मीटर तक है । सबसे ऊँची चोटी नन्दादेवी है । केदारनाथ की चोटी भी बहुत ऊँची है । बहुत ऊँचे पर्वत तो हमेशा ही वर्ष से ढके रहते हैं ।

कम ऊँचे पर्वतों पर गरमियों में बड़ा सुखदायी श्रौसम रहता है और हजारों लोग इनकी मनमोहक जलवायु का आनन्द लेने यहाँ आते हैं । नैनीताल और मंसूरी नगर ऐसे ही पहाड़ों पर बसे हैं । दोनों नगर बड़े सुन्दर हैं । मंसूरी को पहाड़ियों की रानी कहते हैं । पहाड़ी भागों की खास उपज मक्का और महुवा है । इन्हीं पहाड़ी भागों में कई जगह फल बहुत पैदा होते हैं । सेब , आड़ू , आलूचा , खूबानी तथा चेरी इन फलों में मुख्य हैं ।

बीच के मैदान में बहुत सी नदियाँ बहती हैं । गंगा- यमुना इनमें मुख्य हैं । ये नदियाँ हिमालय पर्वत से निकलती हैं । इनमें वर्ष भर पानी रहता है ।

यमुना में दक्षिण के पठार की बहुत सी नदियाँ गिरती हैं । चम्बल, बेतवा इनमें मुख्य हैं ।

भिर्जापुर जिले में रिहन्द नदी पर पिपरी नामक स्थान पर एक बहुत बड़ा बांध है । वहाँ बांध के पानी की शक्ति से बिजली पैदा की जाती है । यहाँ से बिजली प्रदेश के बहुत बड़े भाग को दी जाती है । इस बिजली से रेल के बिजली के इंजन भी चलते हैं ।

हमारे प्रदेश के पूर्वी भाग में वर्षा कुछ अधिक होती है । पश्चिमी

भाग में वर्षा कम होती है । इसलिये पूर्वी भाग में धान अधिक और पश्चिमी भाग में गेहूँ अधिक होता है । उपज के अनुसार पूर्व के लोग अरहर की दाल और चावल तथा पश्चिम के लोग उर्द की दाल और रोटी अधिक खाते हैं ।

प्रदेश में अधिकतर स्थानों पर रबी , खरीफ और जायद की फसलें होती हैं । रबी की मुख्य पैदावार गेहूँ , चना , मटर और सरसों है । खरीफ में धान , ज्वार , मक्का , उर्द , मूँग , तिल व मूँगफली पैदा होते हैं ।

जायद की फसल में ककड़ी , खरबूजा , तरबूज मुख्य हैं ।

लखनऊ, वाराणसी और अमरोहा अपने आमों के लिये प्रसिद्ध हैं ।

इसके अलावा अपने प्रदेश में गन्ना भी बहुत पैदा होता है । सारे भारत में जितनी चीनी मिलें हैं उनकी लगभग आधी चीनी मिलें इसी प्रदेश में हैं ।

APPENDIX A-2

English translation of the six passages presented in Appendix A-1 is given here. As boy and girl models as well as man and woman models differed only in their name, just one translation is given for each age level of model's age.

Crow Model

A crow lived on a tree with his parents. He was the only child. Before going out, his parents used to tell him every day not to go out of the nest.

It was summer. The parents of that crow had gone out in search of food early in the morning. While going out, they had told the crow, as was usual, not to go out of the nest. He was therefore sitting in the nest quietly.

He remained calm and quiet for a long time. It had already become noon, but his parents had not returned yet. The hot wind was blowing. He was, therefore, very thirsty. There was not any water near by. He waited for his parents for a long time. But they did not come. So, he thought to go out and drink water somewhere. He also thought that he would return earlier than his parents.

He flew out of his nest in search of water. Because of hot summer, he felt miserable. Once he thought to return, but he was very thirsty. Water was essential for him. He looked around. All the rivers, streams and ponds were dry. There was no water available. It was dry everywhere.

The crow reached a garden. A pitcher was lying there. The crow became very happy. He sat on the pitcher. But he was dejected

when he saw that there was very little water in the pitcher. His beak could not reach the water.

Suddenly an idea came to him. A heap of pebbles was lying at some distance. He thought to pick up a few pebbles and drop them in the pitcher. He thought that a few pebbles could raise the level of water and so he would be able to drink it.

He started picking up pebbles from the distance and putting them into the pitcher. He got tired after putting only a few pebbles. He looked inside the pitcher. There was hardly any difference in the level of water. It was not possible for him to drink water. Heat of the sun and thirst in him continued to bother him.

The crow realized that he would die of thirst if he lost courage. So he went on putting pebbles into the pitcher, although he was very tired. He ran out of the pebbles. The water was still out of his reach. However, it appeared that the water would come high enough by adding only a few pebbles.

He again showed courage and started collecting the pebbles scattered around and putting them into the pitcher. This time the water came up. The crow's beak reached the water easily. He drank water to his full satisfaction, and flew away, saying caw, caw.

Child Model

Ramu/Reema was the only child of his/her parents. He/she was good in his/her studies, and was a very brave boy/girl. They lived on a mountain. It rained there continuously throughout the year. Storms were also frequent there.

One night when they were sleeping, a sudden storm came. There was a lot of hue and cry. People started running out of their houses. Ramu/Reema also ran out with his/her parents. While running, he/she got separated from his/her parents.

It was a dark night. There was a lot of hue and cry all around. He/she called his/her parents. Due to the loud noise of the storm, nobody could, however, hear his/her voice. For some time he/she steadied himself/herself but suddenly he/she lost his/her feet. He/she was blown away by the storm and it carried him/her to an unknown place. He/she got hurt and became unconscious.

After becoming conscious, he/she found that it was morning and that he/she was lying in a trench. The trench was very deep. He/she thanked God that he/she was alive. He/she cried for help from the trench but there was no one around to hear him/her. He/she got very depressed and started looking for a solution. Suddenly an idea struck his/her mind. There were many stones lying in that trench. If these stones were collected at one place, he/she could come out by climbing on these stones. But it was a difficult task.

He/she started collecting stones. He/she continued collecting stones of all sizes. When the heap was somewhat high, he/she stood on it to see if it was high enough. But the edge of the wall was still too high for him/her.

He/she became very tired. He/she was also feeling very hungry. The sun had also risen high. He/she was sweating badly. But he/she did not lose his/her perseverance. After taking rest for some time, he/she started collecting stones again. He/she started bringing big stones by rolling them. After heaping them together he/she stood on them and tried again. The edge was still out of reach.

After taking rest for some time, he/she tried again. All the nearby stones had already been collected. Now he/she started bringing stones from further distances, and collecting them. Now the heap was quite high, but again some more stones were needed.

Ramu/Reema, who was exhausted, hungry and thirsty, tried again. He/she had to bring hardly a few more stones. This time he/she had to go quite far to bring the stones. He/she was badly tired but did not lose hope. He/she fell down many times while bringing the stones, but the labour did not go in vain. This time he/she could come out from the trench by climbing on the stones.

After coming out from the trench he/she saw his/her village in the distance. After walking sometime, he/she met his/her parents and the villagers who had been searching for him/her. The parents became very happy after meeting him/her and praised him/her for his/her courage and perseverance.

Adult Model

There was a man/woman known as Shyam/Radha, who lived in a village. He/she was very good and laborious person. He/she had two children. They lived on a mountain. It rained there continuously throughout the year. Storms were also frequent there.

One night when they were sleeping, a sudden storm came. There was a lot of hue and cry. People started running out of their houses. Shyam/Radha also ran out with his/her children. While running, he/she got separated from his/her children.

It was a dark night. There was a lot of hue and cry all around. He/she called his/her children. Due to the loud noise of the storm, nobody could, however, hear his/her voice. For some time he/she steadied himself/herself, but suddenly he/she lost his/her feet. He/she was blown away by the storm and it carried him/her to an unknown place. He/she got hurt and became unconscious.

After becoming conscious, he/she found that it was morning and that he/she was lying in a trench. The trench was very deep. He/she thanked God that he/she was alive. He/she cried for help from the trench but there was no one around to hear him/her. He/she got very depressed and started looking for a solution. Suddenly an idea struck his/her mind. There were many stones lying in that trench. If those stones were collected at one place, he/she could

come out by climbing on these stones. But it was a difficult task.

He/she started collecting stones. He/she continued collecting stones of all sizes. When the heap was somewhat high, he/she stood on it to see if it was high enough. But the edge of the wall was still too high for him/her.

He/she became very tired. He/she was also feeling very hungry. The sun had also risen high. He/she was sweating badly. But he/she did not lose his/her perseverance. After taking rest for some time, he/she started collecting stones again. He/she started bringing big stones by rolling them. After heaping them together, he/she stood on them and tried again. The edge was still out of reach.

After taking rest for some time, he/she tried again. All the nearby stones had already been collected. Now he/she started bringing stones from further distances, and collecting them. Now the heap was quite high, but again some more stones were needed.

Shyam/Radha, who was exhausted, hungry and thirsty, tried again. He/she had to bring hardly a few more stones. This time he/she had to go quite far to bring the stones. He/she was badly tired but did not lose hope. He/she fell down many times while bringing the stones, but the labour did not go in vain. This time he/she could come out from the trench by climbing on the stones.

After coming out from the trench he/she saw his/her village in the distance. After walking some time, he/she met his/her children and the villagers who had been searching for him/her. The children became very happy after meeting him/her. The villagers praised him/her very much.

No Model

The name of our state is Uttar Pradesh. Areawise only two states are larger than it. It has the largest population. More than nine crores (ninety million) people live in our state.

Many important events of Indian history have taken place in Uttar Pradesh. Ram and Krishna were born in Ayodhya and Mathura, the cities of this very state. Buddha gave his first discourse in Sarnath in our state.

Badrinath, Kedarnath, Varanasi, Allahabad, Mathura, and Ayodhya are important religious places for the Hindus. People come from all over India to visit these places. People come from all over the world to see the Tajmahal at Agra.

You must have heard the name of Maharani Laxmibai. She fought with the Englishmen for the freedom of India. In the history, she is famous as the Queen of Jhansi.

The northern region of our state is hilly. The height of the mountains is five thousand meters to seven thousand meters. The highest peak is Nandadevi. The peak of Kedarnath is also very high. The higher mountains are always covered with snow.

The weather at hilly places which are not so high is very pleasant in summer. Thousands of people come over here to enjoy the enchanting weather. Nainital and Mussoori are situated on such hills.

Both towns are very beautiful. Mussoori is known as the queen of hill. The main crop of hilly region is maize and madua. At many places in these hilly areas, a variety of fruits are grown. Apple, peach, plum, apricot, and cherry are some of the important fruits.

Many rivers flow through the plains. Among these, Ganges and Yamuna are the main rivers. The source of these river is the Himalaya. They have water throughout the year. Many rivers of the southern plateau flow into the Yamuna. Chambal and Betwa are the main ones.

There is a big dam on the Rihand river at a place Pipari in Mirzapur district. Here electricity is generated through the power of water. Electricity is distributed to a large part of the state. The electricity is also used for moving electric locomotive engines.

It rains quite heavily in the eastern part of our state. In the western region it rains a little less. Therefore, paddy and wheat are grown in the eastern and western region, respectively. According to their products, the people of the eastern region eat rice with Arhar (Toor) and the people of western region eat bread with Urad pulse as their staple.

At most of the places in the state, Rabi (winter), Kharif (monsoon), and Jayad (summer) crops are grown. The main crops of Rabi are wheat, gram, pea and mustard. In Kharif, paddy, millet, maize, urad and moong (kidney bean), til (reasamum)

and peanuts. In Jayad cucumber, musk melon, and water melon are mainly grown. Lucknow, Varanasi and Amroha are famous for their mangoes.

Apart from these the sugarcane is also grown in our state. Nearly half of the sugar mills of India are situated in this state.